# FLYING

JULY
1947
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Two More **FLYING** Holidays
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Pilots' NIGHT SCHOOL page 27

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# Landing the Skystreak—a giant job that called for a midget

TIRES FOR THE NAVY'S new trans-sonic plane, the Skystreak, had to meet three tough requirements: 1) extremely small size to retract into the Skystreak's wafer-thin wing, 2) high inflation pressure to take the landing impact of the 10,000 pound load and 3) sufficient strength to land at the fastest speeds in air history!

The problem of developing a "midget" tire to do this giant job was assigned to B. F. Goodrich engineers. They produced the answer —a 20″ diameter by 4.4″ width, 8-ply, nylon tire which carries 175 pounds air pressure per square inch! This B. F. Goodrich tire combines the smallest size and highest inflation pressure ever used on the main wheels of a plane. And it's a star performer.

Gene May (above), test pilot of the Douglas-El Segundo Skystreak, put this tiny tire through gruelling tests. It passed them all with flying colors!

This is not the first time B. F. Goodrich has pioneered a new type of airplane tire. The first tire engineered and designed specifically for airplanes was a B. F. Goodrich development. The first Type III tire was originated by B. F. Goodrich engineers. The first Type II tire was developed by B. F. Goodrich for an early Grumman Navy plane. And B. F. Goodrich made outstanding contributions to all industry-wide tire developments during the war. Its 38 years' experience in the airplane industry enables B. F. Goodrich to build better tires for today's airplanes —and to engineer sound, lasting developments for the aircraft of tomorrow. *The B. F. Goodrich Company, Aeronautical Division, Akron, Ohio.*

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THE COVER: Warming up a Johnson Rocket 185 for demonstration flight. Photo by Ross-Pix.

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# FLYING

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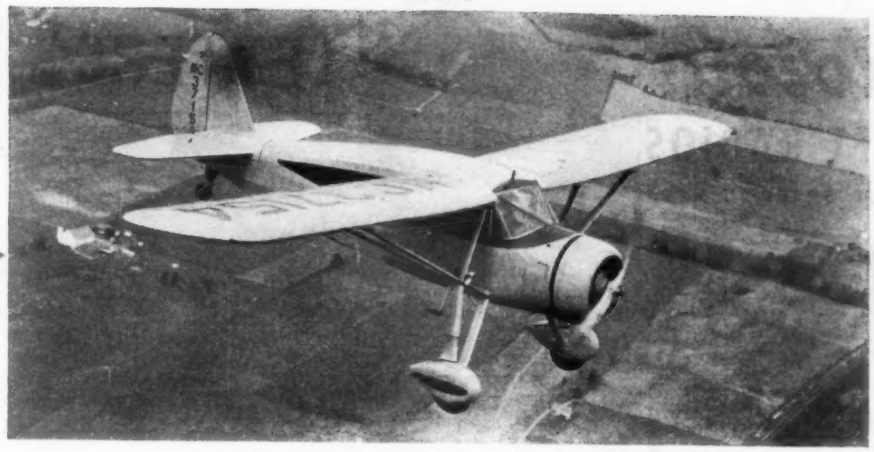

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It's wise to use only fine quality fuels and lubricants. Remember that. And keep in mind also, you can always get excellent quality aviation products by asking for *Phillips 66!*

You'll see—at airports over the entire mid-west—orange and black shields marked Phillips 66. Those signs invite you to stop and take on carefully developed engine oils and UNleaded 80-octane gasoline! Yes, Phillips is interested in helping your plane to better performance and a cleaner engine!

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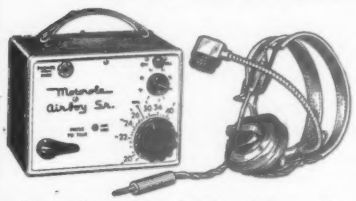

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# LETTERS

### "BETTY JOE'S" ENGINES

In the article "The Long Ranger" (April issue) a caption stated that the P-82 had two Allison V-1650 engines. I believe the Allison is a V-1710. I have read other articles stating the P-82 had a Packard V-1650 and some say an Allison V-1710. Have both engines been installed? Which did the "Betty Joe" have?

GORDON L. HAYNES

Louisville, Ky.

● The first 25 P-82s (including the "Betty Joe") were equipped with Packard-built Merlin Rolls Royce V-1650 engines. All others are to be powered with Allison V-1710 engines.—ED.

### IS NEW HAMPSHIRE'S FACE RED?

It has come to my attention that the New Hampshire Aeronautics Commission has sent a statement to newspapers in its state pointing out that my article "License Fever" (January issue) was untrue as far as New Hampshire is concerned. One clipping from a New Hampshire paper says "the state aeronautics office wishes magazine writers would check facts before galloping into print . . . In (the article) the author makes the startling claim that in order to fly to New Hampshire he had to take out an aircraft license. The odd thing about it is that the aeronautics office, which has the only such records in the state, has no record that the flyer in question ever had, or ever applied, for such paper here. . . ."

I am enclosing a photostat (shown below) of my New Hampshire license. I guess I should have expected something like this, however. As I pointed out in my article, that state charged me $5 for changing my height five inches, increasing my weight seven pounds and changing my blue eyes to hazel. Now, we find, they don't even have an accurate filing system which would help them track down their own mistakes.

J. B. HARTRANFT, JR.
General Manager
Aircraft Owners and Pilots Association
Washington, D. C.

### PLANE DELIVERY

For the past 10 years I've been hearing what the civilian aircraft industry plans to do in the future. Just when does that time come? Personally, I see little hope for the industry until it treats the public a little better.

By way of contrast, I recently took delivery on a 1947 Cadillac for a little over $3,000. It was all cleaned up and polished, everything was functioning perfectly, gasoline tank was filled, and it required neither water nor oil. All this was done by the dealer who had the car only 24 hours.

The same week I took delivery of a new plane. The dealer had it in his hangar for three weeks, since I was away when he received it. Instead of having the plane ready for delivery, the pilot's seat was dirty, the foot pedals and floor were covered with a tar-like substance, glass surfaces were smudged and dirty inside and out, the radio was not working, the engine was leaking oil, and the ash trays were full of debris. There was no heater and none was available. The

(*Continued on page 90*)

1946 No. 1169

State of New Hampshire
AERONAUTICS COMMISSION
CONCORD

C.A.A. Cert. No. [illegible]
Ratings:
General Private
Special
Aircraft Type [illegible]
Airplane Class [illegible]

AIRMAN REGISTRATION CERTIFICATE

This Certifies That
Joseph B Hartranft
Address: International Building
Washington 4, D. C.

Mechanic — CAA Cert. No. — Ratings
Ground Inst. — CAA Cert. No. — Ratings

Has registered as an airman and is hereby permitted to operate aircraft in accordance with the Laws of this State and the Rules and Regulations of this Commission and to the extent authorized by appropriate ratings contained in a certificate issued by the U. S. Civil Aeronautics Administration and for the period such ratings are in effect.

DESCRIPTION

Date of Birth Mar. 9, 1913 Sex M Height 5' 7"
Weight 172 Color of Eyes Hazel Color of Hair Brown

NEW HAMPSHIRE AERONAUTICS COMMISSION

By Russell Hilliard, DIRECTOR. Date SEP [illegible]

ONLY VALID WITH DIRECTOR'S SIGNATURE

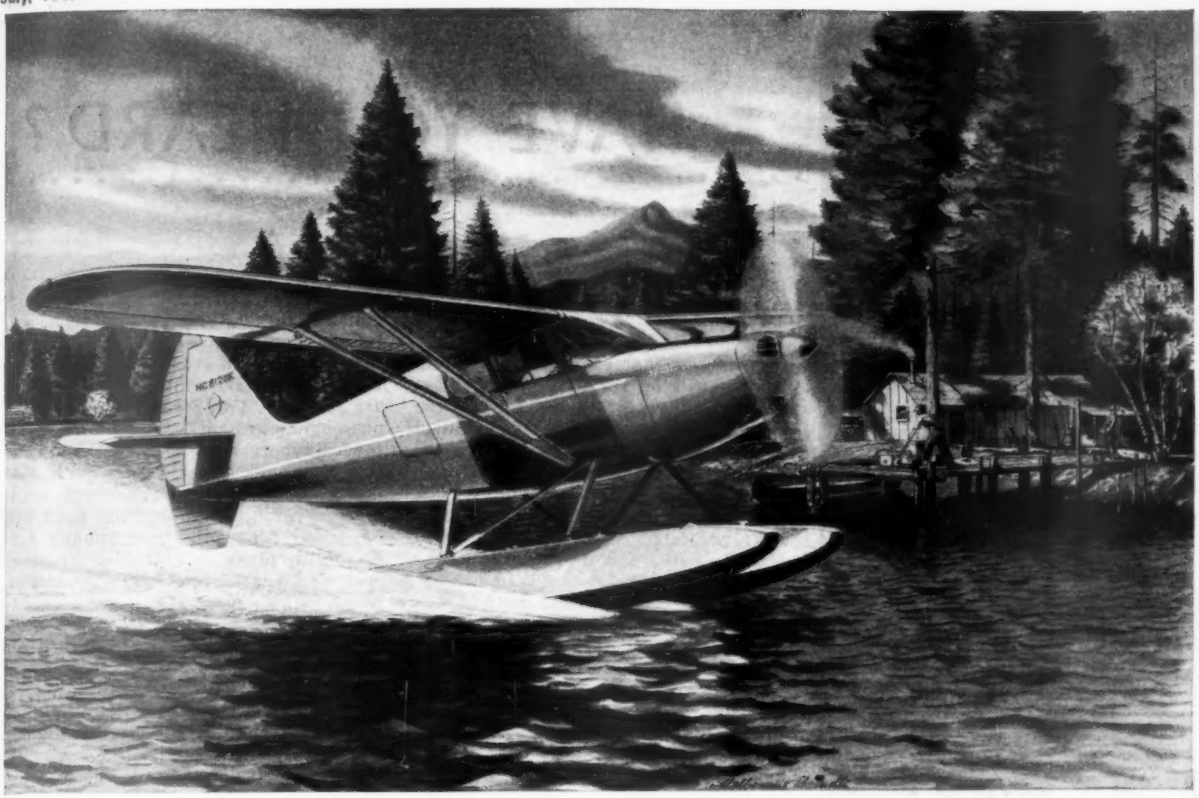
(over)

FORM AERO—9

Airman's Signature: Joseph B. Hartranft

8550

**"Non-existent" license.** Although New Hampshire officials have no record they ever issued a license to Hartranft, he offers photostat to prove he has one.



This lumber camp operator uses his Stinson Voyager, equipped with floats, to fly in food, equipment parts, and other vital supplies.

# Here's America's most useful plane... the great new Stinson Voyager...now available on floats!

LONG FAMED as America's most *useful* personal plane, the 4-place Stinson Voyager is now available with floats, as well as conventional landing gear, to provide even greater utility.

When you fly a Voyager with floats, you don't have to depend on normal airport facilities. Any lake, sheltered bay or sound becomes your "landing strip."

You'll find, too, that this "fly-anywhere" plane, equipped with floats, loses none of its renowned dependability, its easy-to-fly characteristics, its inherent stability.

The Stinson Voyager, when equipped with floats, carries a useful load of 763 lbs. at a cruising speed of 114 m.p.h. It will actually pay for itself in the variety of useful jobs it performs. And for vacations, hunting and fishing trips, it offers you and your family comfort, roominess, and plenty of space for all the duffle you want to take along.

Flaps permit quick take-offs and slow, short landings . . . built-in wing slots for safety. Inherently spin-resistant. Two-way radio with dome loud-speaker. Landing and navigation lights. Sound-proofed cabin has controlled ventilation.

**FREE — 20-page, full-color catalog!**
See the new Voyager at your Stinson dealer's. In the meantime, write for 20-page brochure, beautifully illustrated in full color, giving complete description of the Voyager's many features. Stinson Division, Consolidated Vultee Aircraft Corporation, Dept. D, Wayne, Michigan.

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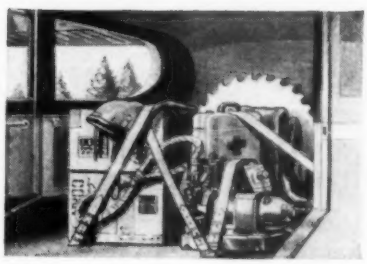

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Load capacity on floats: Pilot, full gas tanks (40 gallons), and 350 cargo lbs. The two rear seats can be replaced in 5 minutes.

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# HAVE YOU HEARD?

. . . **Weather maps transmitted by wire** will soon be available to AAF pilots, which means that even smallest Army airfields will be serviced by the most skilled weather forecasters. Networks of facsimile sets are being installed across the United States, with the country divided into four large networks, each covering approximately 1,000 square miles. Weather analysts in a centrally-located weather station will prepare maps, insert them into the transmitter, and relay copies to stations all over the country. The method was adopted because the shortage of skilled analysts makes it difficult for AAF pilots to obtain clearances at some fields.

. . . **The Northeastern Association of College Flying Clubs** was formed recently when eight New England flying clubs got together at Yale University. General aims of the association: (1) to foster collegiate aviation; (2) to stimulate intercollegiate flight activities and friendly rivalries; (3) to hold an annual northeastern intercollegiate meet under standardized flying procedures; and (4) to better the bargaining position and general prestige of collegiate flying clubs. Colleges represented were Wellesley, Connecticut, Smith, Princeton, Dartmouth, Amherst, Mt. Holyoke, and Yale.

. . . **Three world study tours will take to the air** under university sponsorship this summer. Each tour will be good for credits toward a degree. Columbia University is sending 25 students to Rome, 15 to Bombay; Yale University, 15 to the British Isles. Each tour will comprise an educational field trip built around specific subjects and projects. On their return, students will take examinations and prepare papers on the subject matter covered in the tours.

. . . **"Canning" 2,000 surplus carrier and training aircraft,** the Navy plans to preserve them in a flyaway condition for as long as five years. The process involves sealing the complete plane, with wings folded, in metal containers constructed from 10-foot panels of corrugated steel. The method is considered superior to cocoons of sprayed plastic for storage of small aircraft. Current plans are for a total of 2,020 late model planes (valued at more than $150,000,000) to be preserved at six bases.

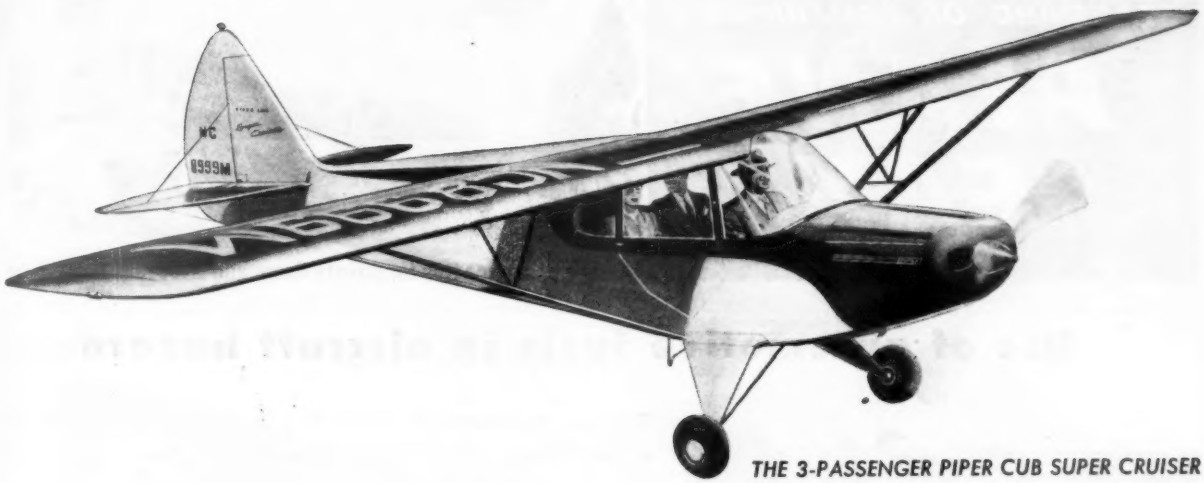
. . . **New Yorkers now have an air taxi service** within a 300-mile radius of the city at a flat passenger rate of 20 cents per round trip mile. The recently-organized service calls itself Air-Taxi, Inc., uses only seaplanes and floatplanes. Planes are based at the Brooklyn Parkway Seaplane Base and company offices are at 102 W. 45th Street. Metropolitan passengers are picked up at the Midtown Skyport on East River. One- and two-passenger Piper planes with Edo floats are used, with larger craft available for groups. Ski landing gear will be added for winter operations. Air-Taxi also plans to franchise branches soon in Washington, Miami, Chicago, Los Angeles and Seattle.

. . . **Employers can help strengthen Air Reserve Training** by co-operating in a recent Air Defense Program proposal that employees be granted military leave each year in addition to regular vacations. This would enable Air Reservists to participate in active-duty training. Federal and state civil service employees would have the same rights granted to enlisted Air Reservists in Government service.

. . . **Rescue parties will aid downed planes** in practically any part of the world, according to plans now completed by the International Civil Aviation Organization. It will take another two years to put into effect the methods agreed upon—use of dog teams in northern regions, helicopters where available, mountain-climbing squads and even a camel corps in the desert. Word that a plane is downed would bring an immediate call to the rescue director in that area. Only three countries are not taking part in the plan—the United States and Canada, which have synchronized rescue procedures operating within and across the border, and Russia.

. . . **Age of the average airline pilot** is 32 years; he weighs 165 pounds, is 5 ft. 10 in. in height, has logged 4,859 hours of flight time. There are fewer than three chances in 100 that he wears glasses; only 2.7 per cent require a lens correction. These statistics were gleaned from a study of all airline pilots who received transport pilot medical certificates in 1946.

. . . **The 14th National Soaring Meet will be held in Wichita Falls, Tex., July** 4-20. Both American and foreign pilots will participate in a series of contests which, officials predict, may break every existing record for motorless flight. The international distance mark of 465.5 miles, established in 1939, is held by a Russian woman. END



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# PIPER CUB

***at a passenger cost of less than***

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That's right . . . the new three-passenger Piper Cub Super Cruiser brings you the fun and fast travel of flying for *less than one-half cent* per passenger per mile for gasoline at its economy cruising speed. At that speed, three people can take a one-hundred-mile trip in this good, safe plane for as little as forty-five cents apiece for gas. No wonder the Super Cruiser is the outstanding plane in the three-thousand-dollar field today!

Powered by a thrifty 100-horsepower engine, the new Piper Cub Super Cruiser will take you cross-country at a top speed of 115 miles per hour. The Super Cruiser has a non-stop cruising range of over 600 miles . . . in fact, 700 miles at the economy cruising speed. Auto-type, spring-filled seats make every flight a comfortable one. An electric starter and a two-way, two-band radio that gives both airways and regular broadcast reception are included as standard equipment on the Super Cruiser. Yet it is lower in price than any similar plane!

Ask your Piper Cub Dealer for a free flight demonstration, for the full-color literature on the new Piper Cubs and the new, revised edition of the book, *How to Fly a Piper Cub*. See your dealer, also, for low-cost flying lessons, plane rentals and his convenient Piper Taxicub Service. Remember—only Piper makes the Cub, that good, safe plane. Piper Aircraft Corporation, Lock Haven, Pennsylvania, U. S. A. In Canada: Cub Aircraft Corporation, Ltd., Hamilton.

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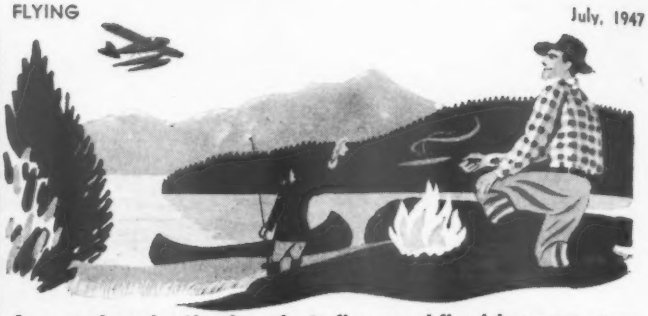
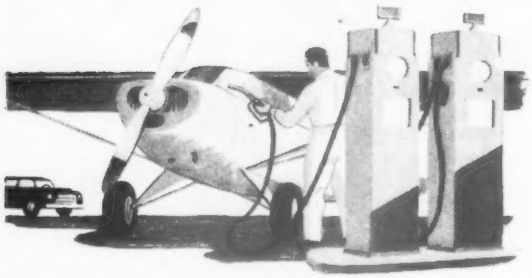


A page of service tips for private flyers and fixed-base operators

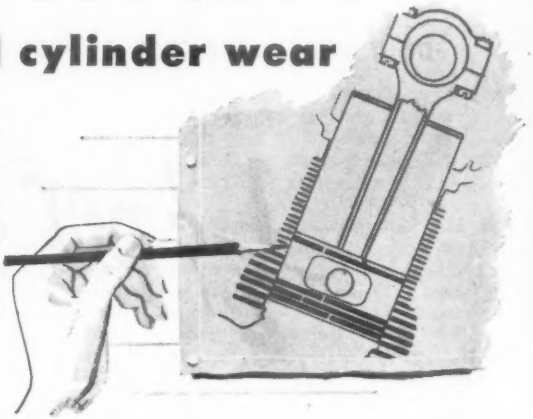
## Use of automotive fuels in aircraft hazardous



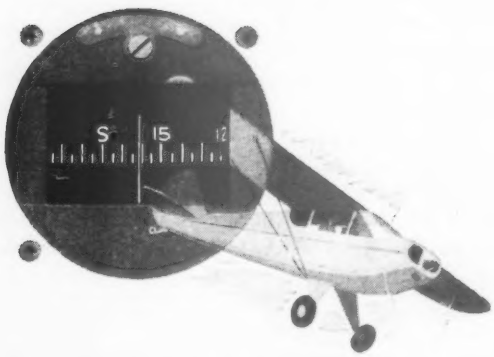
Gasolines engineered for automotive engines are not suitable for aircraft because of their high lead content which sometimes results in lead fouling on aircraft-type spark plugs... also because of the hazard of vapor lock, which may result in engine failure in the air. Aircraft engines require a perfectly balanced fuel such as Chevron Aviation Gasoline to give easy starting, smooth idling and dependable performance at high altitudes.

## How "RPM" reduces ring and cylinder wear

The most difficult place to lubricate in aircraft engines is the upper ring travel. This is where temperatures are highest and, since ordinary oils move from hot to cooler areas, upper cylinder walls are often left bare of lubricant. RPM Aviation Oil is compounded to stick to hottest areas and save ring and cylinder wear. "RPM" also contains a "detergent" which keeps pistons and cylinder walls clean, rings free and prevents ring-groove deposits.



## Pamper your compass to stay in the groove

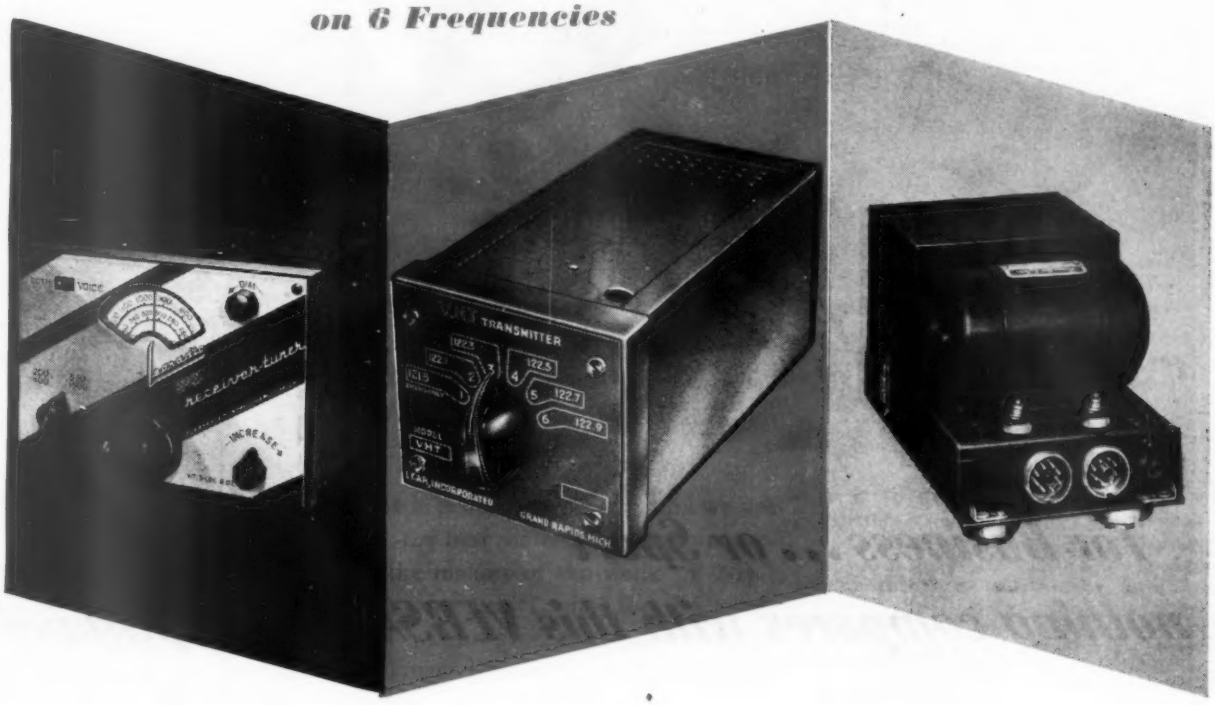


During cross-country flights your compass is the boss. That's why it deserves a little pampering and extra care. Experienced pilots depend on RPM Compass Liquid to do the job. It meets exacting fluorescent tests and will not affect the luminous paint on instruments. Its controlled viscosity provides correct damping of compass dials at all temperatures.

**CHEVRON NATIONAL CREDIT CARDS** are good at airports throughout the United States and Canada. Ask your Standard Airport Dealer in the West... or write to Standard of California, 225 Bush St., Room 1618, San Francisco 20, Cal.

# ALL-WEATHER FRIEND

***The Lear Personal Plane Transmitter-receiver with Plenty of Power on 6 Frequencies***




Here's a high-performance transmitter-receiver for your light or family plane that gives consistent transmission even under adverse atmospheric and skip conditions. It has plenty of power—5 to 7 watts. And it covers 6 VHF channels.

The receiver tunes both beacon and broadcast bands and operates at either headphone or loudspeaker level. It has an illuminated dial with dimming control.

The power supply is dynamotor driven. This unit is remotely located and also contains the IF and Audio sections of the receiver and the modulators for the transmitter.

So, everything you need in an aircraft radio is here in this Lear Radio. It's compact, easily installed, and weighs only a few ounces over 15 pounds complete. Get all the information about it from your Lear Aircraft Radio Dealer.

***DISTRIBUTORS: Desirable territories are open.***

# LEAR

*The Name Men Fly By*

# RADIO

LEAR, Incorporated, Aviation Radio Sales, 110 Ionia Avenue, N. W., Grand Rapids 2, Michigan

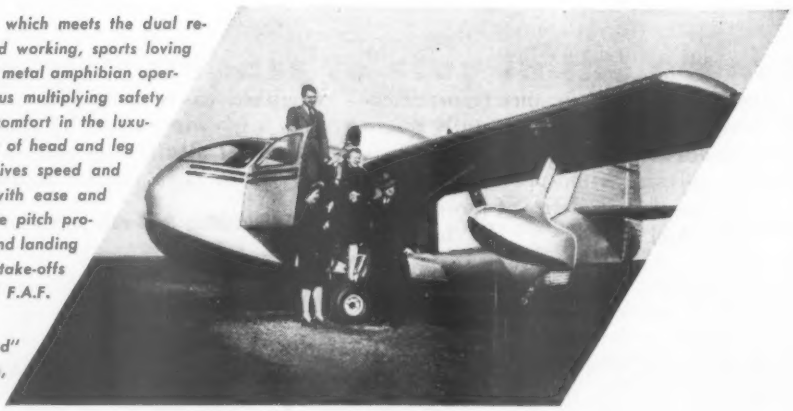
**QUICK FACTS ABOUT THE LEAR VHT-6 RBBS TRANSMITTER-RECEIVER**

- Weighs only 15 lbs., 5 oz. complete
- Transmits on 6 bands, 121.5 mc., 122.1 mc., 122.3 mc., 122.5 mc., 122.7 mc. and 122.9 mc.
- Receives on 2 bands 200 to 400 kc., 550 to 1500 kc.
- Transmitter output, 5 to 7 watts
- Antenna-transmitting, 24" whip type fed by 50 ohm coaxial. Receiving, conventional short-length horizontal
- Quick-change packaged construction for ease in maintenance

*New Design for Better Living*

**ERNEST L. OLRICH, JR.** . . . Sales Mgr. of The David Clark Company, Inc. Special Research and Development Div. of Munsingwear Company . . . lauds value of the De Luxe Seabee for "our quick contacts with suppliers and buyers" . . . "a natural for maintaining liaison with other divisions" . . . also stresses playtime plus . . . "only hour and a half by Seabee to favorite salmon lakes reached before only by two day combination of train, buckboard, and canoe." . . .

# "For Business . . . or Sport nothing compares with this VERSATILE amphibian"



The one personal plane which meets the dual requirements of today's hard working, sports loving executive . . . The Seabee all metal amphibian operates from field or stream, thus multiplying safety factors many fold . . . Relaxing comfort in the luxurious four place cabin with plenty of head and leg room . . . The 215 H. P. Franklin gives speed and range enough to get you through with ease and economy . . . Controllable and reversible pitch propeller, and hydraulically operated flaps and landing gear are standard . . . and assure better take-offs and landings . . . . . Price $6000 F.A.F.

FREE . . . Your copy of "Transportation Unlimited" Write Dept. N-1. . . . Republic Aviation Corporation, Farmingdale, Long Island, New York. . . .

De Luxe Seabee

A PRODUCT OF REPUBLIC AVIATION

Makers of the Mighty Thunderbolt

# "Nothing but the best" in the Funk "F-2-B"

## "...that's why we use 'LUCITE'*"

**The Funk "F-2-B" is a 2-place, side-by-side, closed land monoplane. Top speed—112 mph. Cruising speed—100 mph. Has many features that make flying safer and easier. Slow landing speed of 37 mph. Exceptional stability so that stall or spin is practically impossible. One-piece full-vision Du Pont "Lucite" acrylic resin windshield for panoramic view.**

## OTHER USERS OF "LUCITE"

All-American "Ensign"

Beech "Bonanza"

Commonwealth "Skyranger"

Culver "Model V"

Globe "Swift"

Meyers "Mac 125"

Piper "Super-cruiser"

Republic "Seabee"

**"OUR PLANE** is a quality product, and we use nothing but the best material for its construction," say the makers of the Funk "F-2-B." "That's why we use 'Lucite' for the windshields and windows. 'Lucite' gives better vision and longer life. It is easy to form and therefore makes for better streamlining."

When your plane needs a new enclosure, be sure to ask for "Lucite" acrylic resin. It's the best, and economical too. In medium and greater thicknesses "Lucite" costs even *less* than other plastics sometimes used. E. I. du Pont de Nemours & Co. (Inc.), Plastics Dept., Room 257, Arlington, N. J.

*REG. U. S. PAT. OFF.

**HOW TO GET THE BEST RESULTS FROM "LUCITE"**—*To clean off dirt and grit,* wash the enclosure with a soft cloth or sponge, in warm soapy water. Rinse the sponge often to remove grit. Finally, flush the surface with clear water and allow to dry.

**RIGHT WAY**—Always use a soft cloth or sponge, plenty of clean water, to preserve the smooth surface.

**WRONG WAY**—Trying to wipe off "Lucite" enclosures with a dry rag may cause scratches, impair vision.

***For added protection, wax** "Lucite." After you have thoroughly cleaned the enclosure, apply a thin, even coating of a good auto body wax to protect the plastic.*

**FOR VISION—"LUCITE"** transmits over 90% of light rays. Can be formed in one piece, eliminating ribs and blind spots.

**FOR SERVICE—"LUCITE"** stands up to the weather, hot or cold. Does not warp. In normal service, lasts for the life of the plane. "Lucite" is shatter-resistant, light in weight. Has good dimensional stability; resists vibration.

**FOR INSTALLATION—"LUCITE"** is easy to install and care for. It costs even less, in medium and greater thicknesses, than other plastics sometimes used.

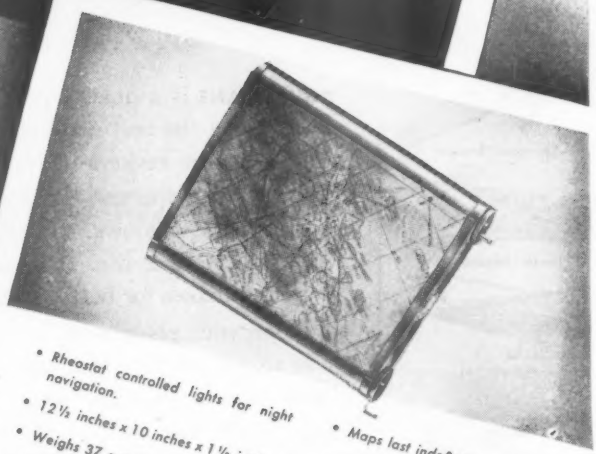
DU PONT
REG. U. S. PAT. OFF.
Plastics
BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

# Rolaire MAP CASE and NAVION FACTORY DEALERS BOTH OFFER YOU SOMETHING New!

**All Navion Factory Dealers offer unexcelled service to Navion owners. Do you own a Navion or plan to buy a Navion in the near future? Then be sure to get acquainted with your nearest factory dealer right now! You'll like his "know how" and the special service he will give you.**

**(P.S. He'll also be able to sell you a Rolaire Map Case.)**

Jean Scanlon and Bob Patrick, of the Coastair division of North American Aviation, plan their trips in a Navion the easier, more convenient way, with the Rolaire Map Case.



- Rheostat controlled lights for night navigation.
- 12½ inches x 10 inches x 1½ inches.
- Weighs 37 ounces.
- Rough crackled finish eliminates glare.
- Plastic face for penciled notations.
- Maps last indefinitely.
- 24 feet of maps on any one roller.
- Loads and reloads like a camera.
- Mileage scales.
- Rolaire Navtabs.

## APPOINTED NAVION FACTORY DEALERS

GULF AERONAUTICS
Marshall's Field
Buckner Blvd. — Route 3
Dallas, Texas
J. W. Marshall

ST. LOUIS FLYING SERVICE
Kratz Airport
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HOWARD AVIATION, INC.
Mount Hawley Airport
Peoria, Illinois
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MALLARD AIR SERVICE, INC.
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Los Angeles Municipal Arpt.
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PALO ALTO ARPT., INC.
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Sky Ranch Airport
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VAN'S AIR SERVICE
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St. Cloud, Minnesota
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Municipal Arpt., Hangar No. 3
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ROLAIRE *Engineering*

DEPT. F, 2500 WEST SIXTH ST.,
LOS ANGELES 5, CALIFORNIA

# You'll GO places

## WITH THE *EXTRA* RANGE, *EXTRA* SPEED

## AN AEROMATIC* PROPELLER GIVES YOUR PLANE—AUTOMATICALLY

**TAKE OFF:** Automatically, with engine at full throttle, Aeromatic Propeller assumes low pitch . . . gets plane off ground quickly . . . allows use of full take-off power.

**CLIMBING:** Automatically responds to natural forces . . . increases pitch as air speed increases . . . gets plane to cruising level fast . . . on minimum fuel.

**CRUISING:** Aeromatic automatically maintains the most advantageous pitch for top cruising performance on minimum fuel at any level up to critical altitude.

**LANDING:** Aeromatic automatically adjusts its pitch for a long, flat glide . . . moves to low pitch instantly for a quick pickup if the pilot overshoots the field.

That's right! An Aeromatic Propeller will help you get the most out of your flying. Here's why:

***IT'S COMPLETELY AUTOMATIC!*** The Aeromatic Propeller is the *only* completely self-acting and self-contained propeller . . . varies its own pitch automatically for peak performance all the way. There are no extra controls to fuss with . . . no extra instruments to watch.

***PUTS MORE PEP IN YOUR PLANE!*** One-fourth shorter take-off run! One-third higher rate of climb! Greater cruising range and speed! All with less fuel consumption, less engine wear! That's what you get from Aeromatic—"the propeller with a brain."

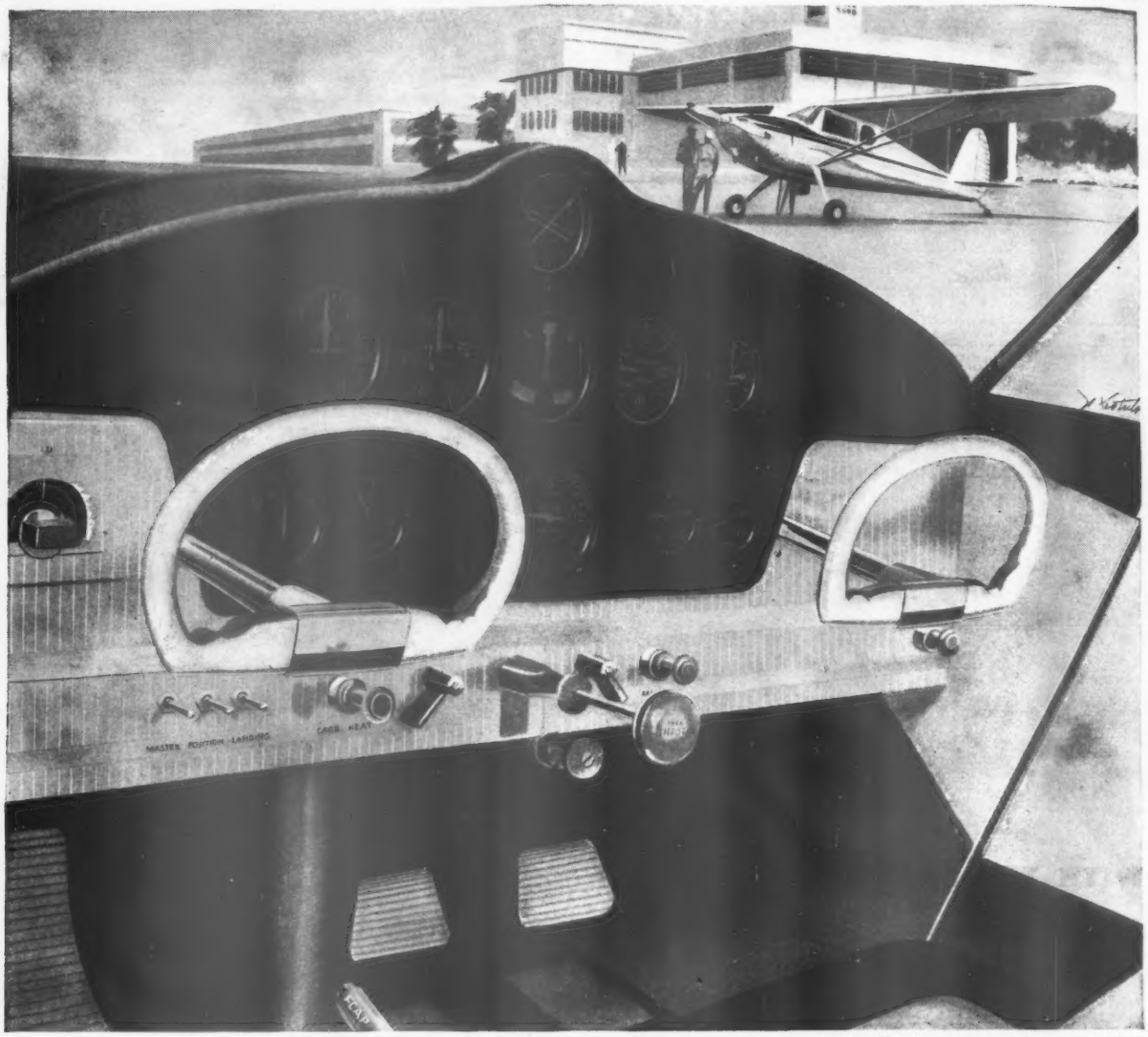
***WRITE FOR INFORMATION!*** If you own a new plane or plan to buy one, enjoy the extra advantages of an Aeromatic Propeller. Write to your aircraft manufacturer or distributor and see if you can have an Aeromatic on your plane. Or drop us a line for your free Aeromatic booklet. Koppers Co., Inc., Aeromatic Propeller Dept., 237 Scott St., Baltimore 3, Maryland.

**Aero matic**

*The propeller with a brain* K KOPPERS *for your private plane*

*Reg. U. S. Pat. Off.

Air Controlled Automatic Propeller-Licensed Under Patents of Everel Propeller Corp.



A completely equipped panel with the basic flight group and a Kollsman Direction Indicator Compass

# The Best Instruments May Cost the Least

The manufacturer who installs good instruments in the first place eliminates the cause of burdensome servicing costs and replacements — both for himself, his dealers and the plane owner. Particularly since the introduction of the moderately priced Scout Instruments by Kollsman for private planes, the cost of the best instruments is frequently much less than the original purchase price and maintenance cost of the cheapest units. Further, good instruments add so much to the pleasure and the utility of flying itself that, again, their small extra cost seems smaller still. So look for Kollsman Instruments on the planes you plan to buy or fly.

**KOLLSMAN AIRCRAFT INSTRUMENTS**

PRODUCT OF

**SQUARE D COMPANY**

ELMHURST, NEW YORK • GLENDALE, CALIFORNIA

# Silvaire

**SETS THE PACE...**
**AND THE PRICE!**

## AMERICA'S LOWEST-PRICED *All-Metal* AIRPLANE

Never before has flying America had an opportunity to buy so much plane for so little money! Here's the smoothest 65-horsepower personal plane in production today... all-metal from nose to tail and from wing-tip to wing-tip! SILVAIRE, the only lightplane in production with an all-metal wing, comes complete... no extra equipment necessary for year 'round flying pleasure. For your own personal use or for training students—you can't match it!

The Silvaire Standard is economical to operate and maintain—per ground mile cost is comparable to that of a medium-priced automobile ... and maintenance costs are negligible, because the Silvaire is *hangared for life in its own all-metal skin* ... and you fly in all-metal safety!

*Ask your local Silvaire dealer today about a free demonstration flight.... Discover how easy it is to fly and buy America's lowest-priced all-metal personal plane. Down payment as low as .....* **$832**

Also available is the 85-horsepower SILVAIRE DE LUXE... sleek, luxuriously appointed, meticulously finished in every detail. For complete information on the famous line of ALL-METAL Silvaires, in both 65 and 85-horsepower, write Dept. F-6.

**Silvaire By Luscombe**

Silvaire by Luscombe is manufactured under U. S. Government Approved Type Certificate and is Government certified to be completely airworthy.

**LUSCOMBE AIRPLANE CORPORATION**
**DALLAS, TEXAS**
*FIRST IN ALL-METAL PERSONAL PLANES*

# Your Office Door Opens On 48 States

## with a Beechcraft BONANZA

● A business may have an office or a factory in a single location, but it may nevertheless plant its roots in every state in America! And Beech has brought to American business the machine that can help do the job — the Beechcraft Bonanza.

Here is air transportation calibrated precisely to the size of the majority of business enterprises— a 4-place airplane that can carry people and luggage for as low as one cent per passenger mile . . . and practically at airline speed! Its 750-mile range qualifies it for long hops. It goes *where* and *when* you want to go and it will land you on the smallest of fields.

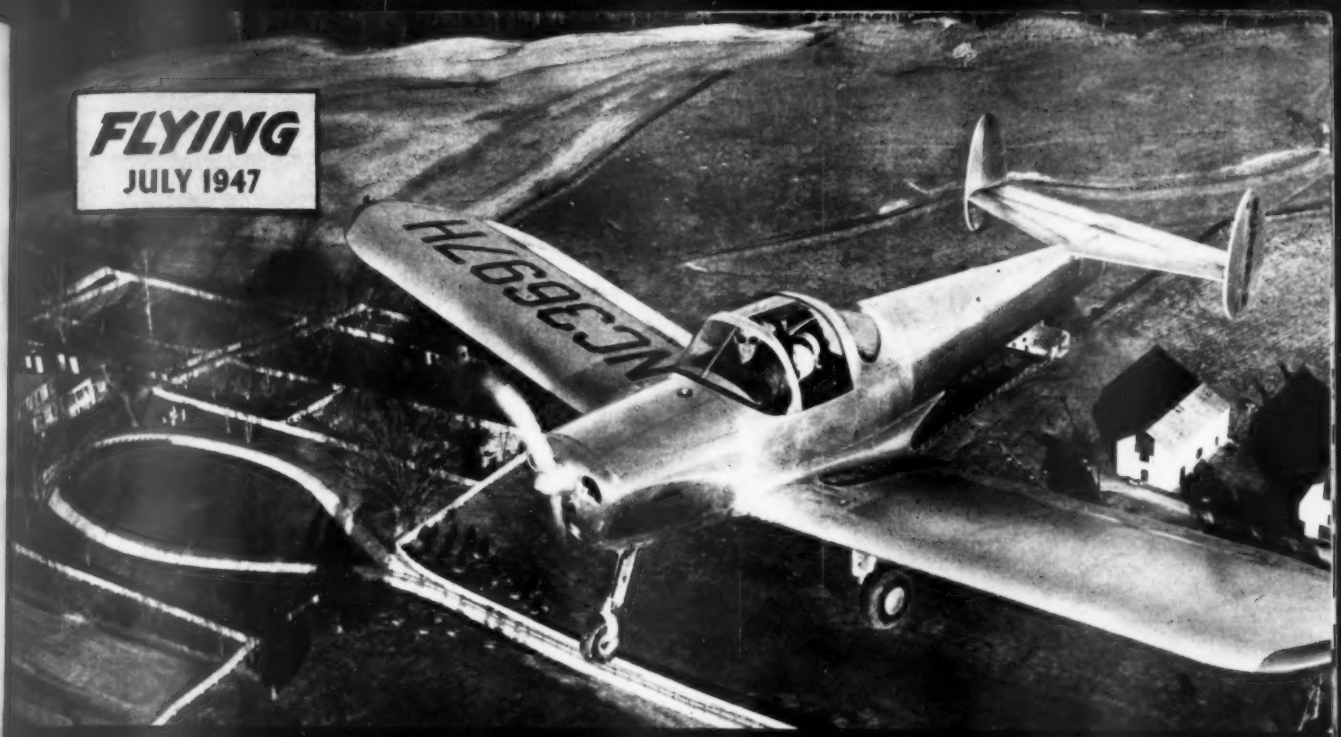
The Bonanza is luxuriously appointed, comfortable, and quiet— quiet as an open-window car traveling at 55. It is fully equipped— two-way radio, landing lights, instruments, heater, flaps, electrically retractable landing gear, controllable propeller and a host of special refinements.

● *Top Speed, 184 mph; Cruising Speed, 172 mph; Range, 750 miles*

There is a Beechcraft distributor near you ready with other facts and figures. We are now delivering Bonanzas on the large backlog of firm orders created by the heavy demand for this airplane. Additional orders will be filled in the sequence received. Beech Aircraft Corporation, Wichita, Kansas, U. S. A.

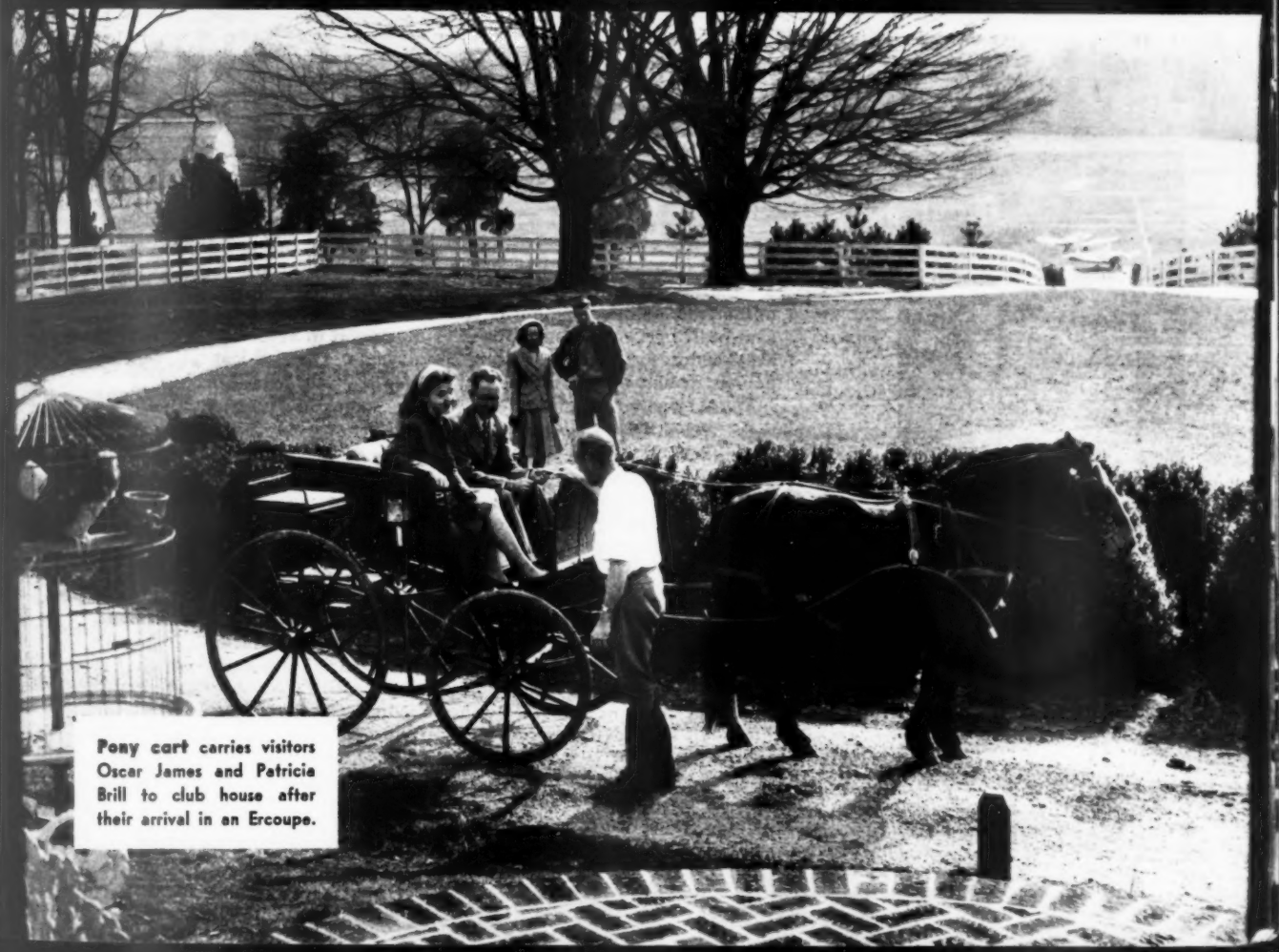
BEECHCRAFT BONANZA MODEL 35

FLYING
JULY 1947




Historic estate 20 miles south of Washington becomes luxury club for private flyers.

# Sky Club...



Pony cart carries visitors Oscar James and Patricia Brill to club house after their arrival in an Ercoupe.

**Visiting planes** can taxi up to the back door of the historic mansion by either one of two taxi strips. There is only one landing runway, however, because an additional strip would require possession of an airport license, which has stiff requirements in Maryland.

**Mattaponi Club** also attracts a large auto-touring clientele.

FIFTEEN minutes by lightplane from Washington National Airport is Mattaponi Sky Club, perhaps the most luxurious and certainly the most historic flyers' vacation spot in the country. The half-million-dollar development is centered around an historic brick mansion built by Gov. Robert Bowie of Maryland in 1745. Surrounding it are 300 acres of pleasant rolling countryside. Opened last fall, Mattaponi is owned by C. Elwood Sager, wealthy real estate broker.

FLYING visited Mattaponi with Oscar James and Patricia Brill. As they circled, they saw a 3,600-foot turfed runway with two taxi strips forming a "V" up to the beautiful old house. Instead of taxiing up to the back door, they chose to ride a pony cart. Mr. Sager explains that he has built only one runway at Mattaponi because a state airport license is required if it has two runways and Maryland state regulations are too stiff to warrant the addition. For the same reason only emergency gasoline is available.

Recreational facilities include riding horses, tennis courts, an indoor and outdoor swimming pool, hiking trails and hunting for small game. There are two indoor sun rooms—one of which has a huge rug of lamb's wool. All facilities are included in the rates which are $10 if the visitor stays only for the day. Otherwise rates are $8 per night for a double room, $5 for a single, $2 for breakfast, $3 for luncheon and $5 for dinner. Light wine and beer are served. END

**Pat swims** in 25-foot indoor pool which supplements outdoor pool used in summer. Recreation also includes tennis and horseback riding.

**Indoor sun room** is bright and warm after Pat's swim. This is complete with sand and beach umbrellas. Strongest liquor is light wine.

**Second dining room** in basement of club is attractively furnished. A dinner specialty at Mattaponi Sky Club is roast suckling pig.

**After dinner,** Pat and Jimmy assemble in the living room with other guests to watch Host Sager show off stunts by his pet monkey, Jocko.

**Hammond organ,** with Sager at the keyboard, is an entertainment feature at Sky Club. Outdoor enthusiasts can hike, hunt small game.

# Flight to Breakfast

**Overcrowding** the single strip at Palm Springs, many of the 1,100 breakfast flyers came in three and four abreast (top). But parking (above), handled by Navy reservists, was speedy and efficient.

## *It was just a morning's outing, but it broke west coast records*

MOST colossal "breakfast flight" yet was the one staged early this year at the Palm Springs (Calif.) Municipal Airport. Breakfast hosts—the Los Angeles Junior Chamber of Commerce—had expected about 700 planes to participate. But before the morning was over approximately 1,100 light, medium and heavy aircraft had crowded the mile-long ramp and revetments—and every other open space near the former Air Transport Command strip.

Though it was the sixth annual celebration of the affair, the unprecedented response to their invitation found JCC officials inadequately prepared. There is no radio in the Palm Springs airport tower, and sweating CAA tower operators (*Continued on page* 92)

**Cooks worked hard** but kitchen equipment and food supplies were inadequate for unprecedented turnout. Many went hungry.

**Breakfasting** in desert sunlight, pilots got acquainted, planned return flights. Meal (sausage, eggs, potatoes, coffee) cost $1.75.

**Parked two and three deep** on mile-long ramp and in revetments and other open spaces, the 1,100 planes included everything from Cubs to DC-3s, plus some military and surplus craft. Visitors came from as far as northern California, Arizona and Nevada.

**Take-off lineup** for trip home is led by Navy Hellcat, Navion and Stinson. Officials plan to stage affair at larger airport next year.

**Flagship Oslo,** just in from Stockholm, is being waved to unloading ramp at LaGuardia Field. From there it will go to AOA shops for a 24-hour maintenance routine involving hundreds of inspections.

# An Airliner Comes Home

## *The Flagship Oslo got this grooming after a recent flight from Sweden.*

OUR overseas airlines are the glamor outfits of world transportation. Their cosmopolitan passengers demand not only the swiftest possible linking of world capitals, but the finest sort of service as well. Most stringent requirement, however, is for safety. This picture story shows how that requirement is met. It goes back of plush appointments and attentive service to show the core of hard work that has earned for our international airlines the most outstanding safety record in the world.

Since no emergency landing fields exist along huge sections of their routes, transoceanic airliners must be groomed for perfect operation. Such maintenance must be as fast as it is complete. International carriers cannot be pampered pets; they pay their way in ratio to how closely use of equipment approaches limits of utility.

Take American Overseas Airlines, for instance. One of the three U.S. airlines (Pan American Airways and Trans World Airline are the others) competing in transatlantic service, AOA must schedule as much service as its limited overseas equipment (10 DC-4s and four *Constellations*) can provide. "Turn-around" maintenance inspection, which safety standards require for (*Continued on page* 58)

PHOTOGRAPHS BY WALTER STEINHARD

**First aboard** all incoming AOA aircraft are U. S. Public Health Service officials. They clear the passengers through quarantine.

**Clearance briefcase,** bearing customs declarations on passengers and cargo, is checked by AOA agent and customs official.

**Cargo handling** is speeded by special hoists and conveyances. "Turn-around" inspection gets underway while plane is unloaded.

**Refueling,** to prevent moisture in tanks, is first servicing item. Gasoline to reach alternate ports, plus two-hour reserve, is carried.

**Maintenance office** checks log book and inspection reports, files instruction on clipboard at left, schedules work on board at rear.

**Inspection starts** on communications and electrical systems. There are nine complete radio, eight electrical installations to check.

*(CONTINUED ON NEXT PAGE)*

## An Airliner Comes Home

*continued*

**Power-plant repairs** are completed. If engine-change is needed, extra "power eggs" are used. Four-man crew does job in 10 hours.

**Pressure-testing** a spare hydromatic propeller (price: $2,125), foreman okays it to replace one on which inspection revealed leaks.

**Clearance office** prepares necessary forms (600 copies covering about 10 categories), filing them in briefcase for outgoing flight.

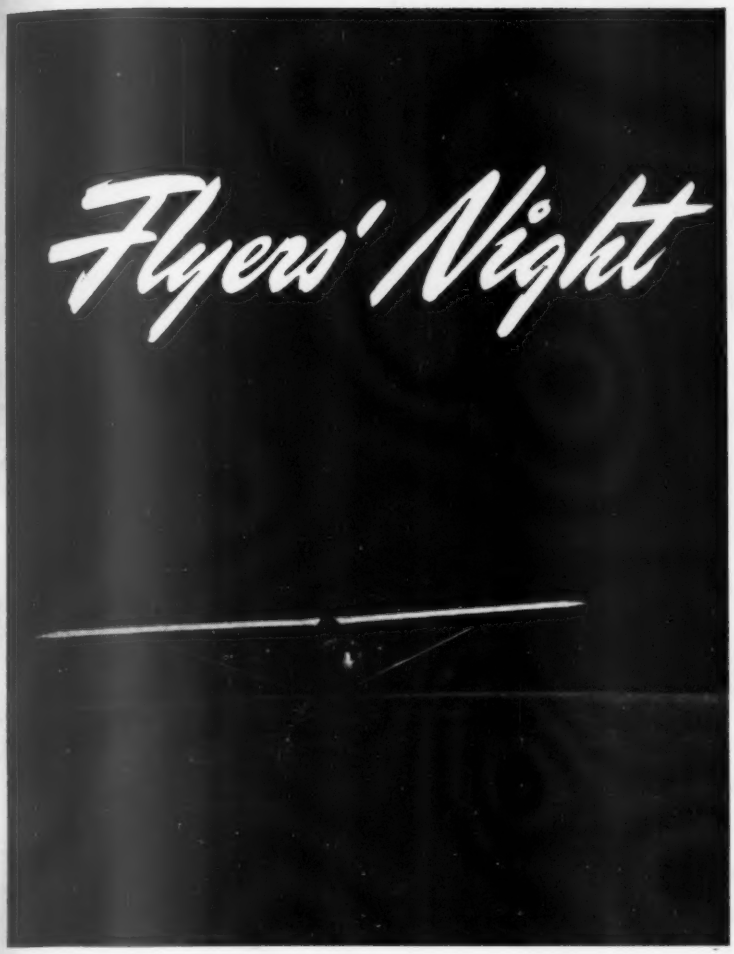
**Dispatcher's office** checks navigator's records for outgoing flight. Relative position of all flights is recorded on the board at rear.

**Last-minute check** is made by flight crew, baggage is loaded and captain briefs crew on flight before passengers go aboard.

**Re-serviced** in minutest detail, Flagship Oslo takes off from La Guardia for Frankfurt only 24 hours after arrival from Stockholm.

# Flyers' Night School

*From solo through private license, you can take all flight training at night.*



**Night-flying Cub** lands at Hybla Valley airstrip with aid of illumination from packaged runway lighting system. Main 5,000-foot runway was lighted originally and results have been so good that two additional strips are being lighted.

**Runway lights** 200 feet apart mark outlines of strip down which Cub is taxiing. They are easily installed.

By

J. WILLIAM WELSH

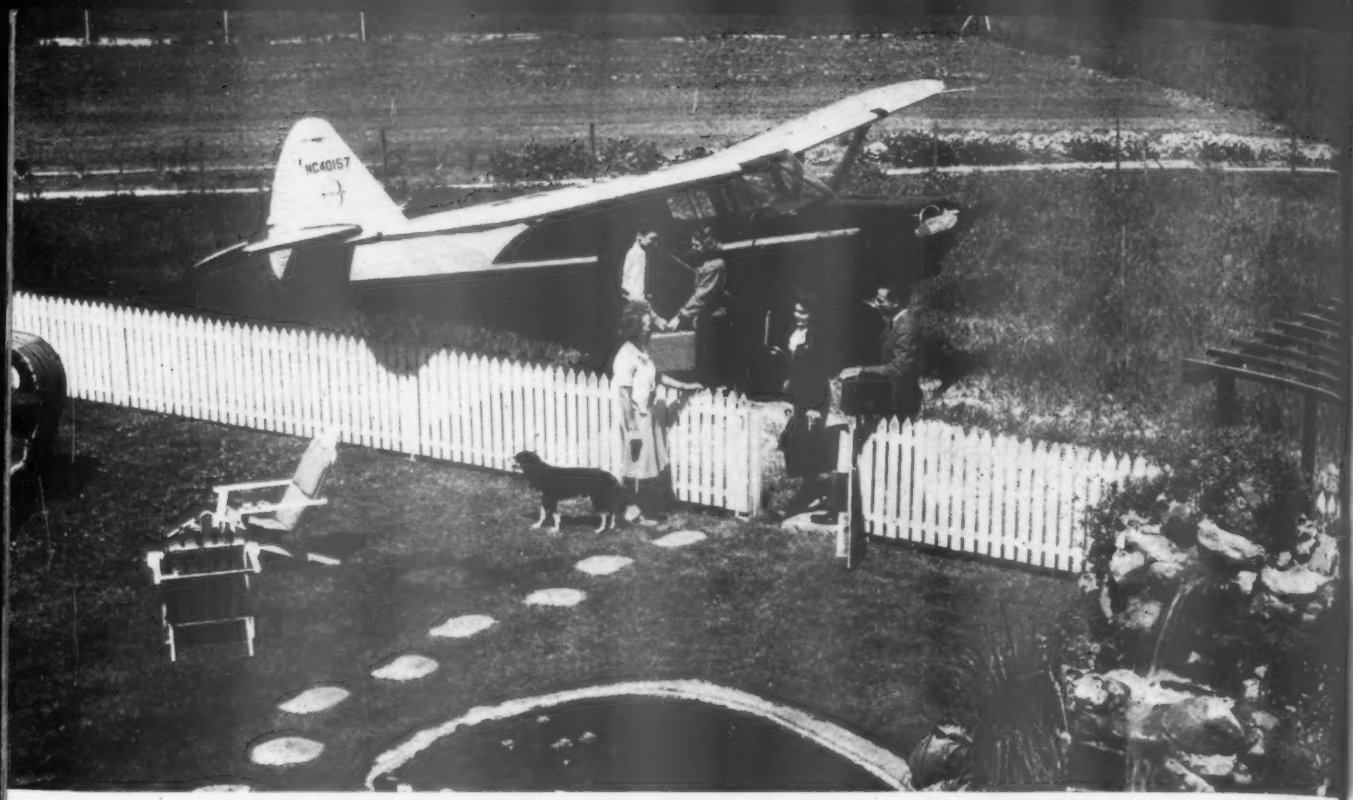
EXPERIMENTS in night flying at the Hybla Valley Airport, near Alexandria, Va., promise a minor revolution in flight training for the private pilot. Already the innovation is making money for its originator, the Ashburn Flying Service. And the most startling thing about the whole idea is its practicality.

Bob Ashburn, owner-operator of the Hybla Valley field, puts it this way: "Most of our potential pilots are just average persons who work all week like the rest of us. Whatever flying they do on week-ends must be sandwiched in among golf, family outings, and a dozen other such activities. It occurred to me that many of them would come a-running to the flight-school operator who introduced flight training as a week-night activity."

To prove his point, Ashburn rigged up a Piper *Cub* for night flying and got a manufacturer of a comparatively new lighting system to use Hybla Valley field for a laboratory. For his first student he selected A. I. Mosier, a warrant officer with the U.S. Army Engineers at Fort Belvoir, Va.

Mosier, who wanted to fly but hadn't (*Continued on page* 88)

**Night ground school** is available at Hybla Valley. After-dark operations are boon to busy day workers.

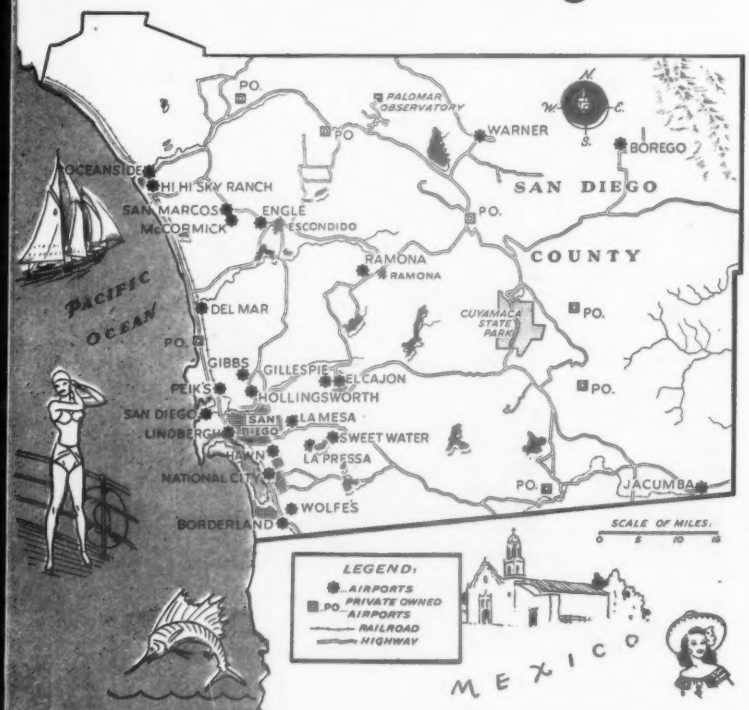


**Flying vacationists** deplane from their Stinson Voyager at private airport, in the heart of the San Diego County resort area.

# San Diego County

A FLYING Holiday

*Here's flying vacationland down 'where California began'*




*For plane owners who are tired of flying around the hometown airport, here is another in a series of features planned to describe areas particularly suited for aerial vacations. Readers are urged to write us about their* FLYING *Holidays.*—ED.

EVERY private pilot outside the state has planned at some time or another to fly to scenic, mild-climated California, so why not make the trip this year as your flying holiday?

A suggested area for the first California visit is colorful San Diego, "where California began." San Diego County is the southernmost part of Southern California, bordering on Old Mexico. Mountainous areas close to coast permit visitors seashore-mountain vacationing.

San Diego offers good beaches, all sorts of fresh-water and deep-sea fishing, hunting, hiking, pool swimming, all sports, night life, and a chance to return home with a deep, lasting California suntan.

In San Diego County there are more than 20 airports for the private pilots, from Class V to Class I fields.

The entire flying holiday (*Continued on page* 73)

**Sightseers** find historic landmarks like Mission San Diego De Aldala (1769) near airports.

**Fishing** begins almost at edge of some airfields, often yields this catch-a-minute sport.

**Mexican handicraft** awaits tourist shoppers at Tiajuana, just over border from San Diego.

**Vacation settings** for a San Diego flying holiday include (right, top to bottom) hidden coves, open sea and excellent hostelries like the luxurious, pleasant Hotel del Coronado.

*ANOTHER FLYING HOLIDAY ON NEXT PAGE*

**Machinac trout** from Traverse Bay waters range up to 50 lbs.; this one weighs 14½.

**Flying sportsmen** arrive in Frankfort, on Lake Michigan, for a vacation in the Grand Traverse Bay area. This picturesque airport is surrounded by hills on three sides.

**Shuffleboard** is a major sport in Traverse City. The second largest courts in the country are located here and state and national shuffleboard championships will be decided on these courts in July. Courts are within walking distance of downtown Traverse City.

# Grand Traverse Bay

*Mackinac trout and cherry blossoms call air travelers to northern Michigan.*

MIDWEST pilots in 100-m.p.h. airplanes are only a few hours from the air-conditioned counties around Grand Traverse Bay, Mich. From Kansas City, they can fly northeastward to their destination in seven hours, including stops. From Cincinnati they are only four hours away, from Cleveland three, and from Chicago only 2 hr. 15 min.

Once there, the flying vacationer will find a lake-tempered climate, where regimented cherry and apple orchards dot the hillsides and where, in a few places still, virgin pine forests march down to the long sand beaches of Lake Michigan. Near the northwest corner of the West Michigan shore, Grand Traverse Bay thrusts two long fingers southward to make the whole region a maritime province. Here is one of Michigan's most famous vacation spots. The five counties of the bay region cover more than 2,000 square miles. There are streams and inland lakes and offshore the great Mackinac trout run up to 50 pounds.

Pilots can fly to four airports in the Traverse Bay area. They are evenly distributed to give access to the entire five-county vacationland. Frankfort is near the Lake Michigan shore. Woolsey Memorial is near Northport on the northern tip of the peninsula between Lake Michigan and Grand Traverse Bay. Bellaire is on Lake Bellaire in the western part of Antrim (*Continued on page* 82)

**Smelt fishing** is a fantastic night sport of early spring. The small silvery fish run up the streams from Lake Michigan and barrels of them are dipped out of the creeks by hand. This scene at Beulah is typical.

# REPORT FROM WASHINGTON

**Swivel-geared lightplanes** may revolutionize entire airport program. Castering gear like one developed for Cub (above) by Goodyear Aircraft Corp., make single-strip airports practicable and safe, reducing costs of extra land.

## By FRED HAMLIN

THINGS AERONAUTICAL are going on in a Connecticut backyard. Seems Charles H. Zimmerman, Chance-Vought designer of Navy's XF5U *Flying Wing* (also see page 33), has built a one-man helicopter. Its twin engines (four cylinders each) power two four-foot props. The props are parallel to the ground and the pilot stands between them on a sort of platform for straight-up flight. For forward speed he leans forward; to land, he squats—a sort of aerial skier. Zimmerman estimates a forward speed of 120 to 130 m.p.h., a possible range of 350 miles. Standard equipment with the winged skis would be a weather-proof suit and a transparent plexiglass face cover—plus an explosive parachute, just in case. If the machine got into production, Zimmerman estimates that it would sell for probably "less than $1,000."

### Swivel Airports?

Could be that the recent budget blitz of Congress against Federal airport funds will intensify CAA's swivel-landing-gear program. Swivel gears make possible cross-wind landings and, hence, permit use of single landing strips. Landing strips are cheaper than airports and, since they require less land, they can be built nearer population centers. CAA has demonstrated successful use of the gear on both large and small planes—latest installations: DC-3, Beechcraft, *Navion*.

CAA Administrator Wright and ex-CAA researcher Geisse fought for the gear against strong opposition both inside and outside the Administration. Actually the project has been pushed around for three decades—it was Louis Bleriot, France's air pioneer, who built the first swivel gear back in 1909.

### 'Copter Quotes

"The helicopter will not get into lightplane competition for five or 10 years," said Igor Sikorsky during a recent visit to Washington. Original cost is the big barrier. Sikorsky cites, for instance, a manufacturer's cost-estimate of $10,000 for a special transmission on one of the Sikorsky experimental designs. For the same transmission produced in 10,000-unit lots, cost estimate was $98 per unit. Even so, Sikorsky predicts that "within two years the helicopter will be a familiar sight all over the world doing the kind of jobs for which only it is designed—commuter and feeder hops using limited landing space, delivering the mail, ambulance duty." Queried about helicopter speed, he pointed out that, while special designs can and will be made to go faster, operation-efficiency will hold speeds to around 150 m.p.h. . . . Walter Bonney, director of public relations for Bell Aircraft Corp., confirmed the Sikorsky views, adding that Bell experts are doing "a great deal of research on the ease of flying the helicopter and its mass-market possibilities."

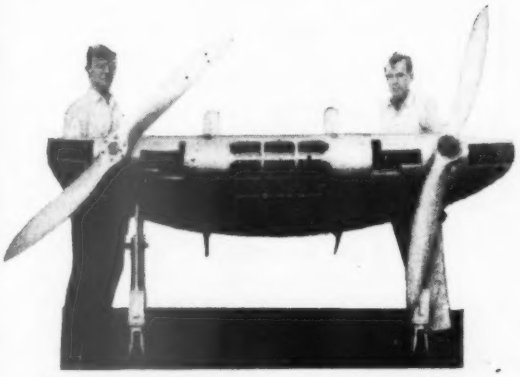
### Glass Planes

One of our correspondents reports that the Army Air Forces may have an all-glass jet job. Background: AAF found that antenna may be torn (*Continued on page* 89)

# Pancake Lightplane

**Pancake on the ground.** The Chance Vought V-173 served as a flying model for XF5U-1. With gas turbines it could hover or go 500 m.p.h.

*Chance Vought's flapjack holds promise as a civil design.*



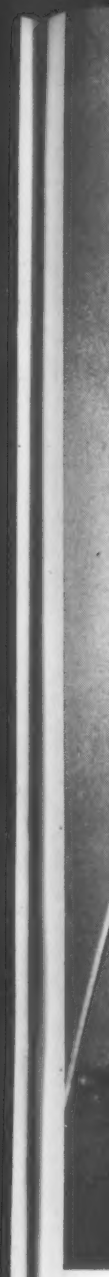
**Inventor Zimmerman, left, and 1935 model plane.**

By HAMILTON FREDERICKS

A WARTIME mystery plane that hovers, flies backwards, lands at zero miles per hour and cruises in the neighborhood of 400 m.p.h. will be redesigned for the post-war civilian market, if a patent recently uncovered in Washington is any indication.

The patent reveals that the craft was originally built for the lightplane field. Experts estimate that wartime improvements could be applied to a peacetime version for production at a cost comparable with conventional lightplanes already on the market.

The wartime version, still being refined under a Navy con-



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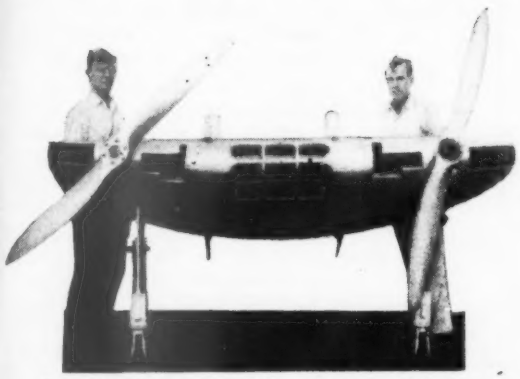

**Inventor Zimmerman,** left, and 1935 model plane.

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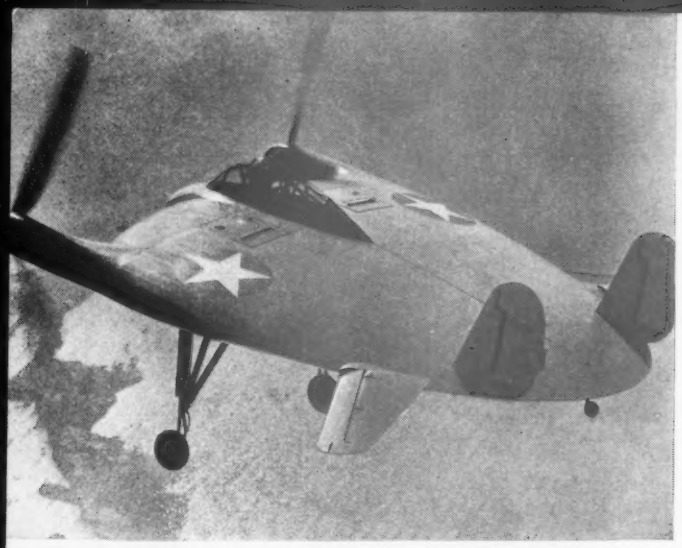
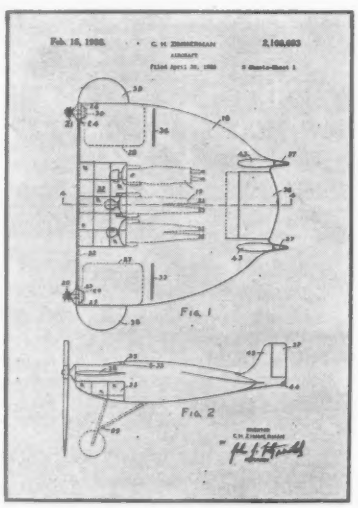


**V-173 in flight.** It is a full-sized but lower-powered model of the radical XF5U-1, developed from Zimmerman's 14-year-old design.

**Scale model flew too,** by remote control. When 1935 model (see page 33) had engine trouble, inventor built this to prove it could fly.

**Charles H. Zimmerman** and front sheet of patent application filed in 1938. His pancake plane was originally designed to carry three passengers lying prone.



tract with Chance Vought at Bridgeport, Conn., is the XF5U "Flying Wing," more familiarly known as "The Flying Pancake" and "The Flying Hamburger." Its designer is Charles H. Zimmerman.

The plane's performance was top secret during the war and its huge propellers and bizarre design, glimpsed on test flights around Bridgeport, were subjects of much speculation.

Now it can be revealed that Zimmerman's original idea in designing the plane was strictly civilian. It grew out of National Advisory Committee for Aeronautics lightplane research that developed the Stearman-Hammond and the *Ercoupe* in the '30's. Fred Weick, *Ercoupe's* designer, was in charge of the NACA research, and Charles H. Zimmerman, a graduate in electrical engineering from the University of Kansas, worked on his staff. Early in the program Weick asked each worker to design an ideal lightplane. Zimmerman came up with his flying wing, which, though considered aerodynamically excellent, was rejected as being too advanced and undeveloped for the time.

This was in 1933. Daunted but determined, in 1934-35 Zimmerman worked evenings and week-ends with Richard W. Noyes and John D. McKellar, fellow-NACA employes at Langley Field, Va., and came up with a twin-engined, seven-foot-wing-span, one-man version of his wing. Engine trouble finally led him to abandon the craft without flying it.

In the fall of 1936 he built a rubber-powered model which performed as he had predicted. He took movies of the wing in flight and showed them to NACA executives. The committee is a pure research organization, and since they felt Zimmerman's wing was well into the developmental stage, suggested that he take the idea to the Air Forces or to an aircraft manufacturer. Zimmerman finally interested Eugene Wilson of United Aircraft Corp., and in the summer of 1937 joined Chance Vought and went to work on the now-famous XF5U.

But his patents on the design reveal that he was thinking of a peacetime plane from the beginning.

"Among the objects of this invention," he says, "are to provide high speed in normal flight, vertical ascent and descent, hovering—an aircraft having improved dynamic stability at low speeds." He also says that the design uses energy usually wasted in the twist of the slipstream, reduces drag by neutralizing wing-tip vortices, and increases the effective span of the propellers.

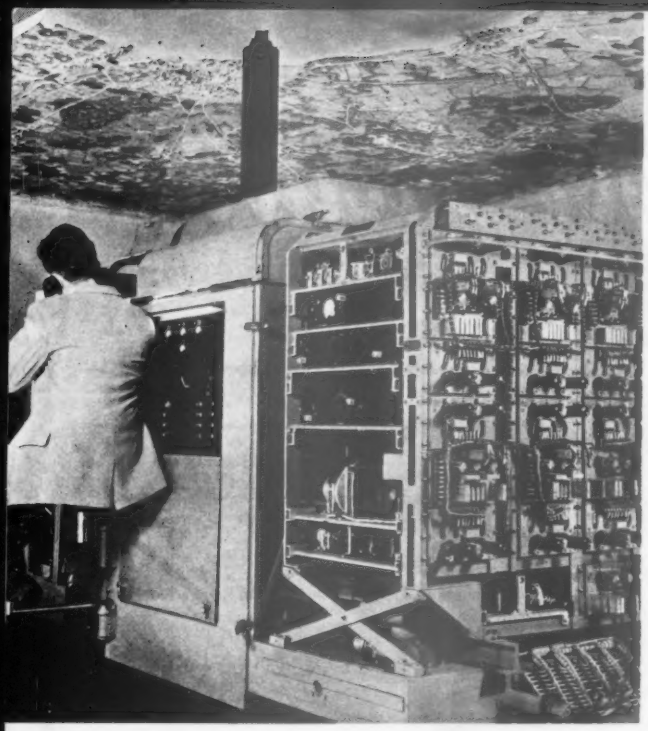
Zimmerman calls his civilian model an "aeromobile." With less power, it would not have the high speeds of the wartime wing but estimates are that it would perform equally well. Envisioned is a two-place, twin-engined, 140-h.p. wing that would cruise around 200 m.p.h. and have a top speed of 260 m.p.h. with two hours' range at cruising. Landing speed could be zero.

The inventor believes that its performance would give all the advantages of a helicopter without the high operation costs. Cruising at 200, it could be flown at an estimated five cents per mile—comparing favorably with an automobile. Since it could be landed on a dime, it would be far more useful than conventional planes which, especially in metropolitan areas, must land at airports far from the center of town and cannot set (*Continued on page* 62)

# Gadget Heaven

**Contact flight trainer** has cockpit resembling that of Hellcat. Lieut. W. P. McCarthy is peering through optical device which makes terrain painted on ceiling seem to be below the pilot.

## Synthetic trainers save the Navy a billion dollars . . .



**Instructor** for contact trainer on preceding page sets up problem on the intricate mechanism. Directions are given over interphone.

**P2V cockpit design** is discussed by Lieut. Comdr. George Hoover, chief of center's flight section, and Alfred Floegel, illustrator.

## *Gadget Heaven*

*continued*

**Magnificent estate** on Long Island is granted free to house Special Devices Center. This is archway to former stables.

By JOHN H. LANCASTER

New York Editor of FLYING

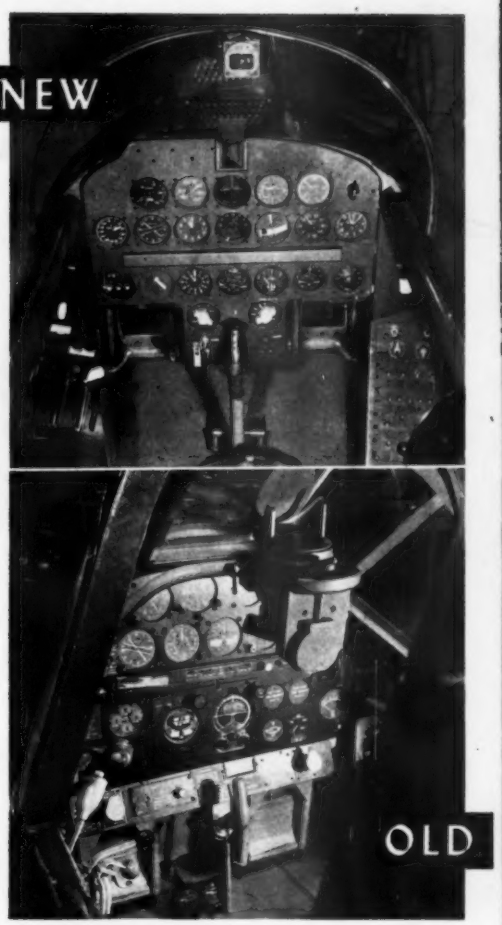
LOWER training costs and increased flying skill are dividends which Navy research should soon be paying to all pilots, military or civil. Nineteen synthetic training devices designed and built by the Navy's Special Devices Center in one war year saved the U.S. Government a billion and a quarter dollars in training costs. They have also saved hundreds of lives and increased the skill of tens of thousands of pilots.

Research to make training easier, cheaper and safer goes on during peace as well as war. In a year when Congress is reducing the national budget, one of the brightest witnesses for the Navy is this six-year-old brainchild of Adm. Luis de Florez, currently quartered on the old Guggenheim estate at Sands Point on the north shore of Long Island.

Special Devices has produced simpler trainers and instruments, new safety gadgets, unorthodox ideas. It's not the Navy's job to translate these accomplishments to civilian flying, but sooner or later they are bound to filter through. For example, how would you like to have a single engine instrument that gave you instantaneously all the information on manifold pressure, r.p.m., fuel pressure, oil pressure, oil temperature and cylinder temperature that you needed? Special Devices has such a gadget. It has a planetarium to train celestial navigators that only costs $200 to build. It has a contact flight trainer in which you watch the terrain unfold and plot your course as if you were flying a regular airplane. It has a trainer in which you can watch a model airplane at the end of a long mechanical arm perform exactly the maneuvers you are "flying" it through.

Bombing trainers produced by Special Devices for the Army Air Forces at a cost of $2,500,000 in one year (*Continued on page 70*)

**Link Bearcat trainer** is a typical synthetic device built by an outside manufacturer for the center. Unlike ordinary Links, it has a seat for the instructor.




**Cockpit simplification** is aim of Special Devices Center. Typical standard cockpit (lower) has 63 controls and devices. New trainer cockpit (upper) is greatly simplified.

**Model Stearman** is ideal classroom trainer. It can be put through all the maneuvers of a real airplane by student sitting in a standard cockpit mockup.

**Automatic position plotter** is shown by Comdr. Robert Noe. Engine indicator, left.

**Toward the Matterhorn,** famed peak which has been circled by glider, soars a Spatinger sailplane. Riffelberg hotel is below.

# Air Sailors

## *Mountain soaring is growing sport for Swiss glider pilots.*

MOUNTAIN soaring, virtually unknown over the broad spaces of America, is almost a must in Switzerland. Alpine pilots get thrills and unparalleled scenery. The Swiss Aero Club has 1,500 qualified soaring pilots who fly more than 400 motorless craft, including the high-performing Moswey III, and the Spalinger S-18 and S-22. Leading camps are in Flims, Davos-Persenn and Samaden-St. Moritz in the Grisons regions; Rochers-de-Naye and Pléiades in French-speaking Switzerland; Villars in Canton Vaud and Crans in Lower Valais. Pilot Alwin Kuhn recently circled the picturesque Matterhorn twice at 13,000 feet. Kuhn and Max Schachenmann soared over the Dom (15,000 feet) and Taschorn (14,700 feet), and the latter also crossed the Bernese Alps from south to north. Recently a pilot was whisked over the Alps and forced to land at Landeck, Austria. Customs officials ignored his "illegal" entry and put pilot and plane on the first freight back to Switzerland. Soaring first received headlines in 1931 in Switzerland and has been growing ever since. END

**Special cars** transport gliders and pilots to mountain camps. This is the Gornergrat railway, from Zermatt to Riffelberg.

**There's hard work,** too. Pilots carry Moswey III last few hundred yards up mountain from station. Winches launch gliders.

**Ready for take-off** is Spalinger S-22. Soaring schools and stiff rating tests are required in tricky mountain soaring.

**Pleasant administration** building attracts students and pilots for hanger flying. Fashionable Long Island communities are nearby.

# Two-Gal Field

**Woman operators** are Charlotte Niles, left; Margaret Lowell-Wallace.

## *Ex-WASPs lease Long Island airport, and service and fly their own planes.*

MECHANICS, pilots, instructors, businesswomen—those are the airport management qualifications of two ex-WASPs who have set up shop at East Hampton, on the fashionable tip of Eastern Long Island. New York-born Charlotte Niles and Margaret Lowell-Wallace, a Bostonian, met when both were members of the Women's Airforce Service Pilots. Each had more than 2,000 hours in the air, and they didn't mind that the staid town fathers of East Hampton raised their eyebrows when they applied for a lease on the abandoned airport three miles from town. They got the lease and started with three half-mile runways, two *Cubs*, and a Fairchild PT-19. Since then they have built a small hangar and installed water, electricity, telephone. The girls do their own piloting, instructing, servicing. They have four planes now and two more on order. Their students range from teen-age scions of socially prominent Southampton families to middle-aged men and women. And they have plans to build a big hangar, smaller "T" hangars, cottages, and eventually a restaurant. END

**Airplane servicing** is one job of versatile woman team. Here Miss Lowell-Wallace gases up a Beechcraft 18. A musician, she once studied the violin.

**A mechanic, too,** Miss Lowell-Wallace checks radial engine on surplus Boeing PT-17 trainer.

**East Hampton airport** lies next to the bays of Long Island Sound. Port was built by WPA in 1937, has three half-mile asphalt runways.

**Instruction, too,** is among many jobs which "two-gal" team is called upon to perform. Miss Niles, in front seat, is a former model and stock player.

**Neat administration building** is kept spick and span with fresh paint, plantings and flowers.

**Float Luscombe** noses up to tuna boat Liberator (above) alongside San Diego Embarcadero and is eased on deck (below). The plane's two-month fishing mission to Galapagos tuna grounds may revolutionize fishing there. It was used to spot schools of fish. From 1,000 feet, an observer in the Silvaire could scan about 85 times more ocean surface than from boat's crow's nest. Craft had a $60,000 catch.

# Flying Fisherman

PHOTOS
BY GENE LYLE

**Swinging boom** lifted the floatplane scores of times without mishap during voyage. Every flight required handling the Luscombe twice—lowering it to the ocean for take-off and lifting it back after landing.

**Pilot George McKusick,** left, examines chart of fishing grounds with George Soares, boat captain.

By HAROLD KEEN
Editorial Department, San Diego Tribune-Sun

*Scout floatplane helped fishing boat find tuna and bait.*

FISHING by plane—that's the tuna fisherman's newest technique. The Soares brothers, George and Joe, are ready to stake their reputation on it. A few months back, when they loaded that pontoon-equipped Luscombe aboard their 115-foot tuna clipper, the *Liberator,* they were almost as dubious about the outcome as were other Southern California fishermen.

The Portuguese and Italians who have made San Diego the world's tuna capital are conservative folk. It had taken 34-year-old George McKusick, former Marine Corps aviator and later test pilot for Pratt & Whitney and for Consolidated Vultee aircraft corporations, plenty of time to get tuna men even to consider the use of airplanes. Only to the Soares brothers, who had pooled many years' earnings as fishermen into a floating investment easily worth $200,000, did McKusick's proposition sound practical. And it was not until the *Liberator* was ready to leave for the Galapagos Islands fishing banks on the Equator, 700 miles west of the Panama Canal, that they made their decision. The only small seaplane available was acquired, cradle-chocks to fit the pontoons were built, and the plane was swung aboard just a matter of hours before the *Liberator* lifted anchor.

So unprecedented was the installation that even Lloyd's of London was perplexed as to the assessment of insurance rates. Because planes had never operated at sea with a modern tuna clipper, there was no way to determine risk. Lloyd's evidently decided that the hazards would be great, because the premium for one year was set at about three times the cost for a land-based plane of the same size.

Even the *Liberator's* own crew looked askance at the added equipment on deck. But before the trip was over, the very men who insisted they'd "never be caught in that contraption" were helping regularly on flights and were talking with familiarity about getting on the step, landing flare out, landing slick, and the like.

And when the *Liberator* returned with 185 tons of tuna for the Sun Harbor Packing Company, a catch valued at almost $60,000, every fisherman along the waterfront suddenly was jarred into a reexamination of what a plane really could do for them. (*Continued on page* 71)

# Who's Afraid of Thunderstorms?

**Black Widow** airplanes carrying sensitive instruments were sent through thunderstorms at levels of 6,000 to 26,000 feet. Radar operators checked their location at all times.

*Dangerous, yes—but not as risky as you've been taught*

By CURTIS FULLER

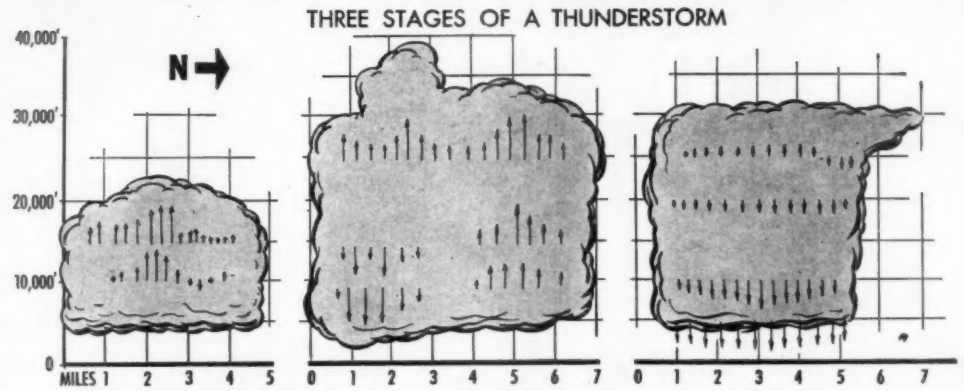
Managing Editor of FLYING

PILOTS who shudder whenever a thunderstorm is mentioned may have been scared needlessly. Science has now come up with measurements which show that a good many thunderstorms are humdrum affairs—for experienced instrument pilots, at least. The black devil supposed to lurk in thunderstorms certainly doesn't exist in every cumulonimbus cloud . . .

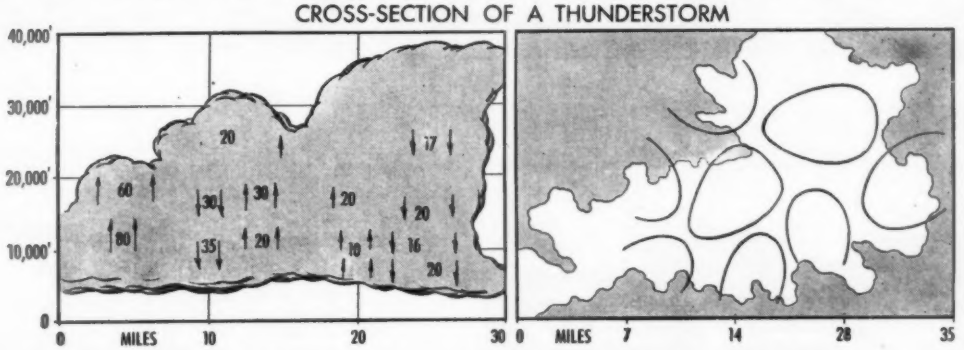
This, at least, is the opinion of experts in charge of the U. S. Weather Bureau Thunderstorm Project who have now completed preliminary analysis of 550 airplane runs through 38 thunderstorms last summer and have plotted a detailed structural analysis of 10 of the storms. Their findings seem likely to excite the greatest aeronautical weather controversy of the century. Yet there is photographic data and calibrated instrumentation to back them up. The weather planes that gathered the information deliberately flew into every thunderstorm within range.

The findings are still preliminary and they deal only with one kind of thunderstorm. By no means do they indicate that private pilots should seek out a good black cumulonimbus cloud for a Sunday thrill. Nevertheless, the directors of the Thunderstorm Project believe that, structurally speaking, lightplanes can withstand the gusts within a storm if—and these are two very big ifs—the plane is adequately instrumented for blind flying and the pilot is an experienced instrument pilot. Few lightplanes, of course, meet blind flying specifications.

Then what about all these stories of crackups in thunderstorms? Of airplanes being (*Continued on page* 66)



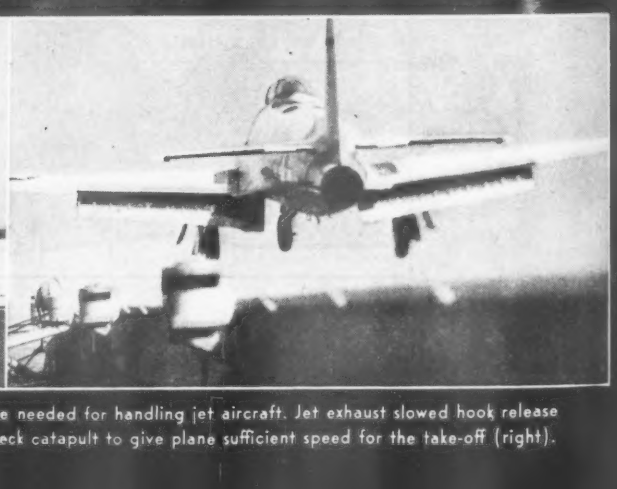

Developing, peak and dissipating stages (left to right) are shown. In developing stage, updrafts predominate. In peak stage there are strong up- and downdrafts; and in dissipating stage, draft is mostly down.




Cells of a storm are shown by three distinct groups of drafts in vertical cross-section at left. Numerals are feet per second. Horizontal cross section (right) shows cells within white radar outlines of cloud.

# JETS AT SEA

**Phantom (FD-1)**, first of Navy's all-jet planes, takes wave-off during recent tests on the FDR.



**Carrier tests of Army's P-80** showed new deck techniques are needed for handling jet aircraft. Jet exhaust slowed hook release after the landing (left). Slow jet acceleration required use of deck catapult to give plane sufficient speed for the take-off (right).

**New Navy jet fighters** are, top to bottom, North American XFJ-1, Ryan XF2R-1 (jet and turbine), and Vought XF6U-1.

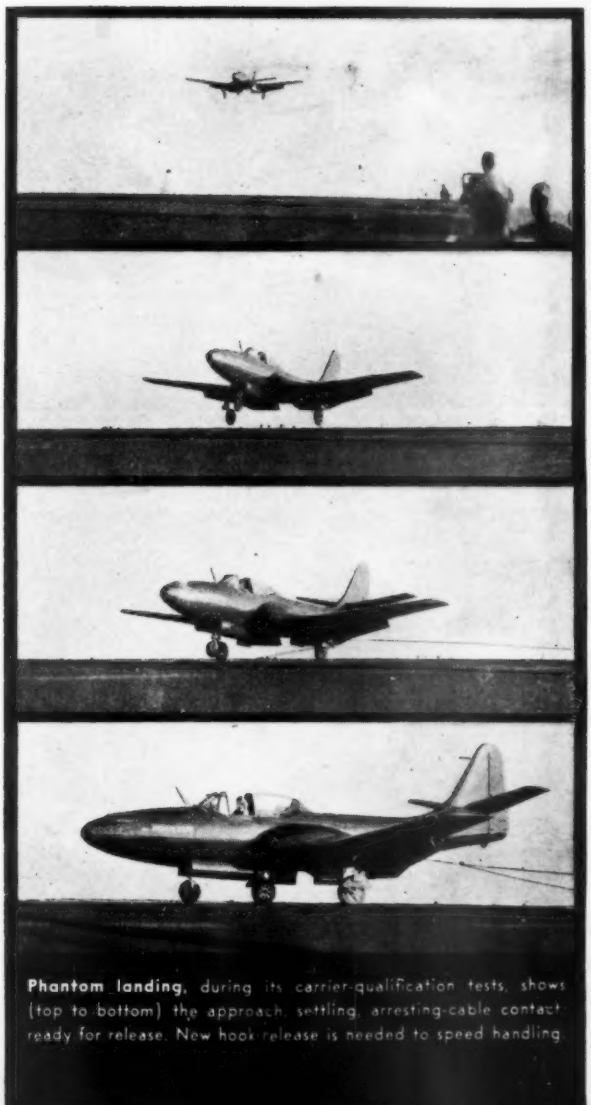
## *Hotter landings and slower take-offs are only some of carriers' problems with jets.*

### By Lieut. Comdr. WILLIAM H. HUFF, USN

JET conversion is the order of the day for all branches of military service that use air support. Sign of the changing times aboard our flat-tops will be the replacement of warnings which read "Beware of the Propellers" with those that say "Beware of the Jet Blast." That new safety slogan is more than a simple warning to deck personnel. It signifies pressing need for complete remodeling of carrier concept as to aircraft handling, maintenance, and strategy.

Any modern airplane is a far cry from models of the '20s, or even the '30s. But changes jet power bring to aviation development are revolutionary. For jet propulsion is more than a complete power-system change. It involves, also, major changes in design of aircraft structures and in the facilities for aircraft servicing. Obviously, cleaner aerodynamic forms are demanded. Piloted jet aircraft now must be built to withstand forces not even known heretofore—the weird stresses that exist at and beyond the speed of sound. And if we are to get the most out of such super air structures we must greatly speed our techniques and equipment for handling them.

For the Navy, jet-conversion dates from its announcement of the FD-1, the McDonnell *Phantom*. This plane was the first Navy all-jet plane, and the first U.S. jet plane to complete its test trials aboard an aircraft carrier. The *Phantom* proved beyond all doubt that a jet fighter is capable of operating off car- (*Continued on page* 76)

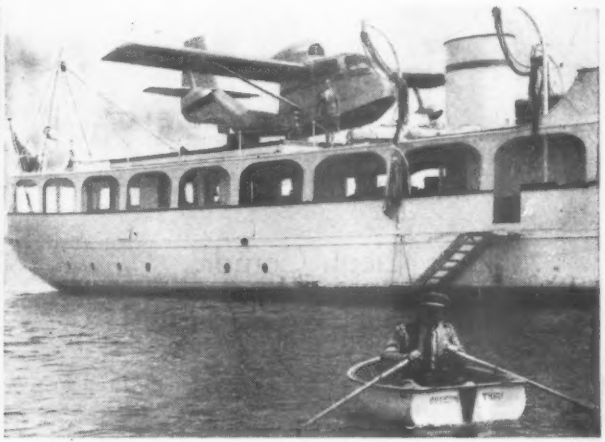


**Phantom landing,** during its carrier-qualification tests, shows (top to bottom) the approach, settling, arresting-cable contact ready for release. New hook release is needed to speed handling.

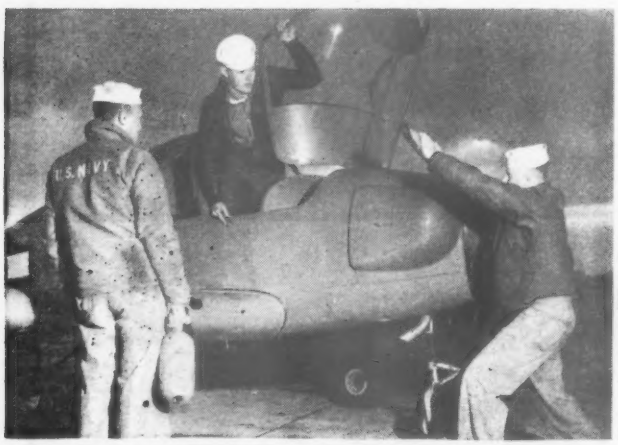
# HAVE YOU SEEN?

**Special Vought plane** used for high-altitude tests of big engines has pressurized cockpit, seats two. Prop is from B-29.

**Convair 240,** now being tested, has two 2,400-h.p. engines and jet exhaust, carries 40. Gross weight is 39,500 pounds, span 91 ft. 9 in.

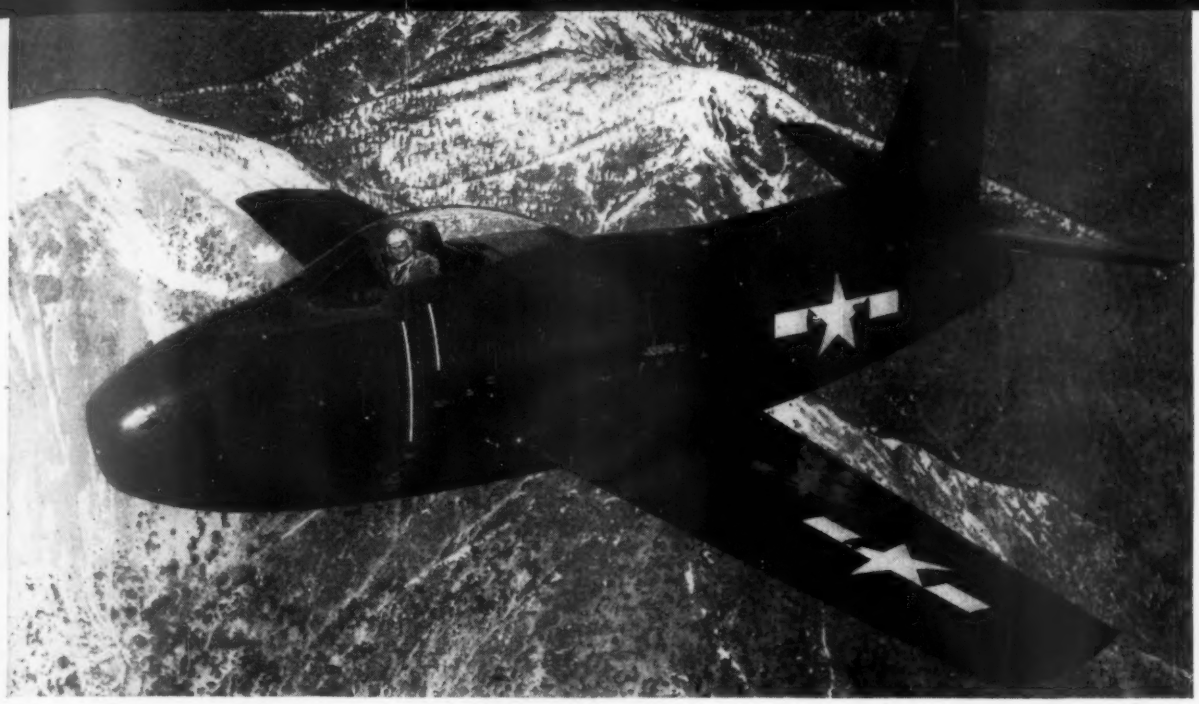


**Yacht-based Seabee** is owned by retired hotel man in Los Angeles. Special deck and launching boom were added for the plane.

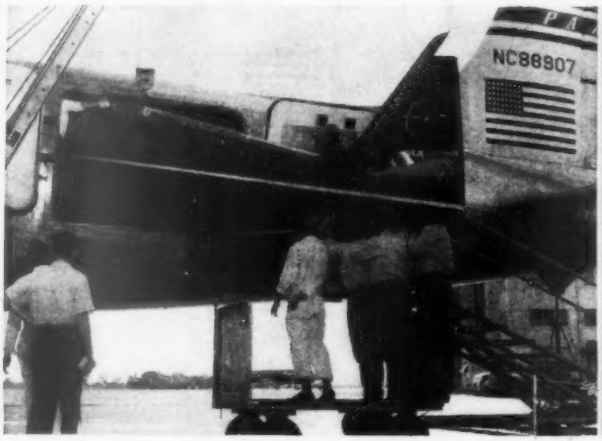


**Culver V's** are being used by Navy as target drones. This is the first standard lightplane used this way. Planes are painted bright red.

**Boeing B-50** will have this new, larger tail. It is five feet taller than the B-29 tail. Vertical surfaces fold flat for hangaring.

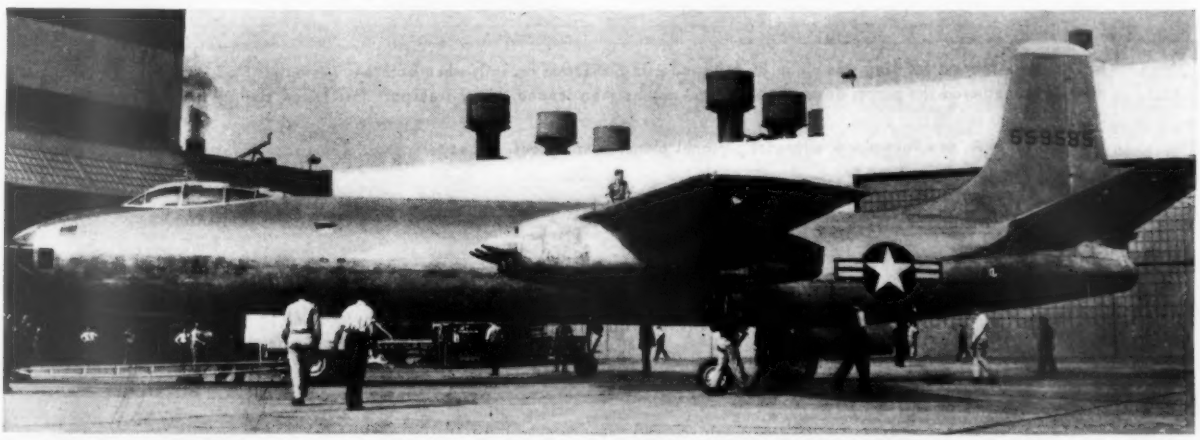


**North American FJ-1** jet fighter for the Navy now is in production. Top speed is over 500 m.p.h. It will be carrier-based.




**Stinson 150's** are being ferried to Brazil by air freight. This one —first of 12—made the 5,000-mile flight in Pan American plane.

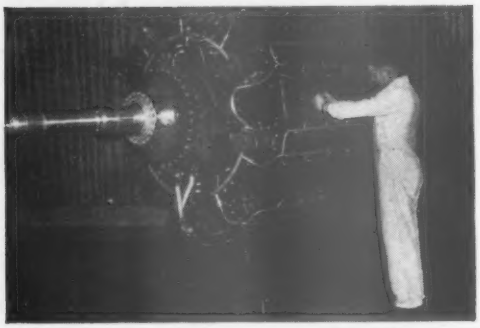
**Beech Model 34,** new short-haul airliner, has four flat engines in wing (driving two props), and V tail. It carries 20 passengers.



**Martin XB-48,** unusual new AAF bomber, has six jet engines, novel bicycle-like landing gear. Main wheels are fore and aft, with small wheels under engines for balancing on ground. Thin high-speed wing would not house usual gear. Span is 108 ft. 4 in.

# HAVE YOU SEEN?

*(Continued)*



**World's largest plane engine** is Lycoming XR-7755. Liquid-cooled and 5,000 h.p., it weighs 3 tons.

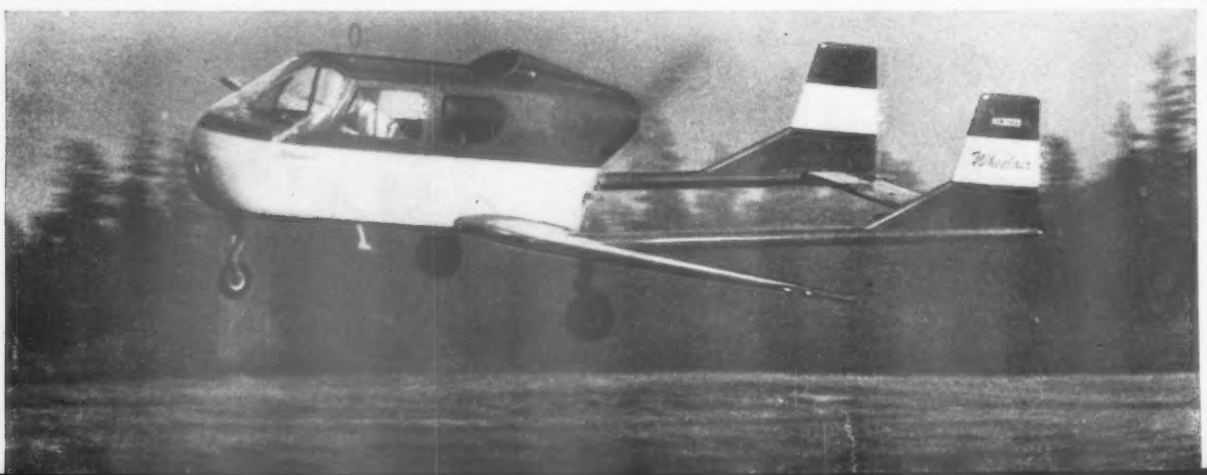
**This stunt job** was made from Great Lakes biplane, now has 145-h.p. engine, special cowl, clipped wings.

**McDonnell Banshee** (XF2D-1), new Navy jet fighter, has top speed over 600 m.p.h., climbs 9,000 f.p.m. Span is 41 feet, take-off gross is 14,000 lbs.

**Novel tie-downs** invented by Lindenhurst, N. Y., operator are link chains with snap hooks at ends (left). Any length can be had in seconds (right).

**Miraculous forced landing** was made by Navy pilot in California recently when both engines on his PV-2 (right) quit suddenly. He feathered the props, dove steeply at 160 m.p.h., then landed. Navy transport (left) flew down with repair parts.

**Wheelair 111A,** new four-place, all-metal personal plane, is spinproof, still experimental. Top speed is reported to be 140.



**Trim lines** of new Cub Special are the result of cleaned-up engine cowl, wings, struts and landing gear. Color scheme is blue and yellow.

**Lowered engine** improves PA-11 visibility.

FLYING's CHECK PILOT

**EDITOR'S NOTE**

*This series of articles is planned to help the pilot and prospective plane owner evaluate aircraft now on the market. Only aircraft holding a CAA Approved Type Certificate are flown. The author is not a professional test pilot. He evaluates each aircraft through the eyes of an average private pilot who flies an airplane either for business or sport.*

# THE PIPER PA-11

AS I sailed along in the front seat of this new *Cub Special* one recent sunny afternoon, I found myself humming an old but very appropriate tune: "Henry Made a Lady Out of Lizzie." My subconscious had sized up this trim little ship even before I'd had time to give the matter much thought.

"Henry" in this case is obviously Bill Piper; he's often been called "the Henry Ford of aviation." And it doesn't take much imagination to recognize the *Cub* as aviation's Model T.

The old J-3 now is gone forever, officially at least. The trainer now in production is the PA-11 (Piper Aircraft, Model 11), which the sales department would prefer you call the *Cub Special*. But the J-3 also was called the same thing in recent years, so we'll use the PA-11 designation just to keep things straight. It's quite apparent that "The Lady" is related to the old-fashioned *Cub*. But you won't have any trouble picking her out of the mob. For one thing she's gone two-toned: blue (*Continued on page* 64)

# I Learned About Flying From That! NO. 92

**Author** and Waco similar to one he was flying in incident described in this article. He was practicing acrobatics when the stick caught under the plane's instrument panel.

## By JOHN PAYNE

*Movie star finds that books don't teach you everything.*

**ABOUT THE AUTHOR**

*John Payne, 20th Century-Fox film player, has been flying more than 18 years and has logged over 1,200 hours. He has a commercial license and during the war spent 14 months in the War Training Service. He recently sold his Boeing Kaydet and as this was written was waiting for a new-type civilian plane. He is looking about for a plane that's faster, cheaper to operate.*

I WAS cocksure I had learned all about flying. I had learned everything the books and the instructors had to tell me. I had soloed. I knew what to do and how, and what not to do. I knew I had to check the airplane before taking to the air, too. I knew it all, and I was ready to go for my private license.

So I climbed into the cockpit of a Waco for another practice flight. A half-hour later, or less, I came out of my first blackout, alive by a miracle—and realized that I had just begun to learn about flying.

This was years back, at the Owens Valley airport near Bishop, Calif. The afternoon was bright, wind-free, perfect for a pre-license practice flight. A friend had put his Waco at my disposal. I checked it all carefully. I did everything the books and the teachers had told me. Then I took to the air.

I figured it was a good time for a few acrobatics. With all the confidence of inexperience I went blithely over on my back in a half-roll. In this plane when flying in inverted position the stick went forward under the dashboard where the instruments were mounted. I planned to retain the inverted position long enough to get the feel of the airplane before rolling into normal position. Then I started to pull her back preparatory to levelling off . . .

*And the stick wouldn't come back!*

I yanked with everything I had. But it stayed there in extreme forward position as tight as though it were bolted fast.

It didn't take more than a second or two for fright to hit me. I had started at good altitude but by this time the engine was nosing her down. A glance at the altimeter showed me about 3,000. I was still nosing down and the stick wouldn't budge. The way the airplane was rigged, the engine kept pulling her down. I didn't dare cut the engine for fear I might go into an inverted spin, or possibly slide off on my tail or one wing.

So I did the only thing that was left. I ducked under the dashboard and began to work on the stick to see what held it forward. Under (*Continued on page 87*)

# A Good Sign to Steer By

You know from experience that the most efficient, most expert dealers usually handle the best products. That's why you can always expect prompt, dependable service from aviation supply dealers displaying the sign shown above—because they handle the world's most popular airplane tires, tubes, wheels, brakes and other aircraft specialties bearing the quality mark of "the greatest name in rubber."

Goodyear products are stocked from coast to coast by leading distributors, assuring quick, prompt deliveries to Goodyear dealers at all airports. Know your local Goodyear dealer; look for the Goodyear sign when you land at strange airports, if you want the finest aviation products—with service to match. Goodyear, Aviation Products Division, Akron 16, Ohio or Los Angeles 54, California.

**MORE AIRCRAFT LAND ON GOODYEAR TIRES THAN ON ANY OTHER KIND**

AIRCRAFT OWNERS AND PILOTS ASSOCIATION

# AOPA NEWS

**Aircraft Owners and Pilots Association is a service organization for the private pilot or aircraft owner. AOPA's full time staff is devoted to helping the individual pilot. Its aim is: "To make flying more useful, less expensive, safer and more fun." Headquarters are: 1319 F Street N.W., Washington 4, D. C. Members also receive a special "AOPA" edition of Flying, newsletters and confidential aviation data. Opinions expressed in this column are not necessarily those of FLYING Magazine.**

AVIATION authorities are wondering if the whole national airport program should be revised. Development of three new caster-wheel landing gears which permit pensonal aircraft to land on a single-runway field regardless of wind direction may revolutionize all future airport planning.

Swivel-gear experiments are sponsored by CAA's Technical Development Division. The problem they pose: Should the airport fund allocation program be redrawn so as to encourage the construction of single-strip airports?

Assuming that swivel gears are universally adopted, airport funds would go approximately three times as far—since ports would require only one runway instead of three. Resultant use of smaller plots of land would make possible the building of more close-to-town or mid-city airports—and that means private plane utility would be greatly increased.

Here are current details in the development of caster-wheel landing gears:

Three companies—Fairchild, Goodyear and Firestone Aircraft Corporation—have delivered successful castered-wheel landing gears to CAA for further tests.

The Fairchild gear, installed on a PT-19, was successfully landed in a 50-m.p.h. crosswind. A Piper *Cub* equipped with the Goodyear gear has been landed numerous times in a 35-m.p.h. wind.

The gear developed by Firestone and installed on an *Ercoupe* has proved adaptability of the idea on conventional tricycle landing gear.

Lloyd Child, assistant to the administrator for Personal Flying Development (CAA) and executive secretary of the Non-scheduled Flying Advisory Committee, states: "We have had everybody we could think of fly and test the castered-wheel landing gear. Many aviation experts praise it as the most important development since brakes were installed."

Child also said that a Goodyear gear will be installed on a twin-engined Beech, a Beech *Bonanza* and a DC-3. Bellanca Aircraft will test a caster gear of their own design on a *Cruisair*.

### STALL WARNING INDICATOR

"A 'must' for aircraft owners who want maximum flying safety is a stall-warning indicator," says J. B. Hartranft, Jr., general manager of the AOPA.

According to Hartranft, AOPA staff members recently tested the Safe Flight stall warning indicator on a *Seabee*, a Cessna and a Fairchild 24. They unanimously agreed that universal use of stall warning indicators will greatly reduce fatal accidents. AOPA aircraft owners have been urged to install the instrument on their planes.

The device operates on an entirely new principle which gives ample warning of an impending stall, regardless of altitude or the type of maneuver being performed. Mounted on the instrument panel, the indicator is actuated by a small metal tab or "vane" protruding from the leading edge of the wing and located in such a way that, in normal flight, the air flow keeps an electric circuit open. As the plane approaches stall speed the vane flips shut, completing the electric circuit which actuates a light and horn in the cabin. Manufacturers state the instrument is equally effective on a P-38 or on a Piper *Cub*.

Safe Flight indicators may be purchased from the Safe Flight Instrument Corp., White Plains, N. Y. for $35. AOPA members may obtain the instrument for $29.75 by sending their orders to AOPA National Headquarters.

### AIRPORT SURVEY

Four hundred and forty-three airports have been rated "above average" by 10,000 pilots participating in AOPA's airport survey, according to Lloyd R. Wilson, AOPA's assistant general manager and survey director.

Wilson estimates the Association's airport files contain pilot reports on approximately 5,000 North American airports. Although only nine per cent received high ratings, the percentage is expected to increase as more airport report cards are received from member-pilots.

"Judging from pilot reports, the safety provisions (fire, crash and first aid) are inadequate at most airports," Wilson stated. "Many fields would receive a higher rating if sufficient safety precautions were instituted."

Pilots report promptness in service and courtesy as either "good" or "excellent" at a majority of small fields. The greatest inconvenience reported is the lack of transportation and restaurant facilities."

### INTERNATIONAL FLIGHT GUIDE

AOPA's "International Flight Guide" is now available to all members. Listing permanent and temporary U. S. airports of entry, the guide briefs pilots on every phase of foreign flight in the Western Hemisphere. It includes instructions for clearing customs, lists the fees charged and equipment requirements, charts preferred routes and gives many other helpful hints for a safe and enjoyable flight.

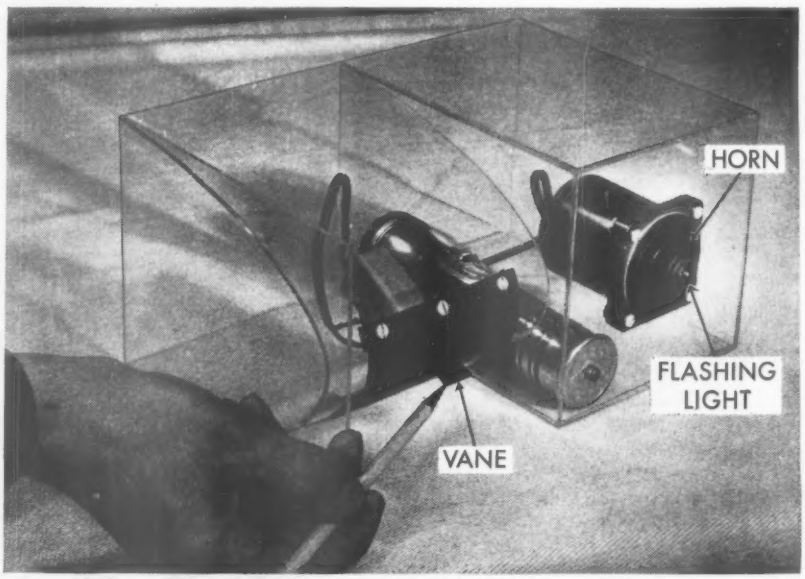
### TITLE SEARCH SERVICE

Substantial savings may be made by AOPA members through the Association's new title search service.

Aircraft title search costs $2.50 via the AOPA plan. In the past, nominal search fees have run from $5 to $18. Interested members should write their Association for complete instructions. Participating pilots must be current AOPA members.

### CAR EMBLEMS

A new supply of AOPA emblems for automobile license-plate installation has been received at National Headquarters. They may be purchased by AOPA members for $1 each. END




**Stall warning indicator's** parts are illustrated by plastic mockup. When wing nears a stall, tiny vane (at tip of pencil) trips electrical circuit, blowing horn and flashing light.

## HINT TO PILOTS PLANNING SKY HOPS—

**BETTER-THAN-EVER '47 CESSNAS** offer many features for full flight pleasure . . . easy, economical upkeep.

Cessna

**Approves Socony-Vacuum Aviation Products!**

•From their patented safety landing gear to their sound-reducing stainless steel engine mufflers, the new 120 and 140 model Cessnas scientifically blend dependability with comfort and good looks.

And to protect their fine performance characteristics, Cessna emphasizes the importance of *correct lubrication* in approving Socony-Vacuum Aviation Products for every flight need!

Protect your plane with Socony-Vacuum's special aviation greases, instrument and hydraulic oils. And try famous Mobiloil Aero—Mobilgas Aircraft for sensational *Flying Horsepower* performance!

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# THE LIBRARY

**OPERATION LIFELINE, by James Lee with photographs by Joe Rosenthal. Published by Ziff-Davis Publishing Company, 185 N. Wabash, Chicago 1, Ill., in 1947. 168 pages. Price $5.**

Of the numerous reportorial works covering the various phases of World War II, *Operation Lifeline* is among the best. A well-written photo-narrative document on Naval Air Transport Service, it is a "must" for persons who would be well-informed on aviation's significant wartime transport operations.

For those who want facts at their fingertips, there is terse, easy-to-remember reporting by James Lee, top-notch war correspondent. For those who read pictures, there are photos by John Rosenthal, known best for his famous flag-raising photo taken on Iwo Jima's Mt. Surabachi.

All too often, treatment of such subject matter drifts into a dry, catalogued, statistical logbook of miles-flown and cargo-carried with little relief save adjective-heavy praise for the feats performed. Here is treatment, however, that traces with simplicity the tremendous channeling of men and material into what actually became the lifeline of our war effort in the Pacific.

A foreword by the NATS commander, Rear Adm. J. W. Reeves, Jr., sums up the reasons why NATS was needed and the basic problems faced in its formation. Avoiding the box-score technique, the text traces the amazing facts concerning NATS growth and operation. Gratifyingly modest is the credit given for herculean feats, the well-deserved praise accorded those who guided each phase of the mighty project.

Here, then, is the story of NATS, a branch of service which, in March, 1942, comprised five R4D planes (Naval version of the commercial airline DC-3), 27 officers and 150 men. The whole business operated from half a hangar at the Norfolk Naval Air Station.

But by September, 1945, NATS was operating 431 planes and, at war's end, was serving over 56,000 miles of routes. It was flying nearly 2½ million scheduled miles per week—36 million ton miles of vital supplies and cargo. Its planes were hauling 77,500 passengers and 4,000 tons of mail per month to the most remote spots on the globe.

It's a story well told. Special credit must be given for photo-text continuity, with both kept in closest possible relation. Rosenthal's black-and-whites are startling in their clarity, and his color shots lend vivid relief.

With type selection somewhat larger than usual, the book is printed for easy reading and bound for permanent adornment of libraries and home bookshelves.

—LAWRENCE KEIL

**THE FLYING NORTH, by Jean Potter. Published by The Macmillan Company, 60 Fifth Ave., New York, N.Y., in 1947. 260 pages. Price $3.75.**

This is the story of Alaska's bush pilots, and of their passengers—the "flyingest people under the American flag." It is the first comprehensive treatment given a vital phase of man's conquest of the Far North.

The author, a former staff member of *Fortune* magazine, became interested in Alaska during an assignment there just prior to the time the United States entered the war. Much of the material she gathered then went into her first book, *Alaska Under Arms*. Returning, in 1943, she spent a year and a half collecting data on the men who have pioneered the airways of the north.

The simple, narrative style of Miss Potter's writing gives the reader intimate glimpses into the lives of airmen like restless, modest Carl Ben Eielson, whose 1928 trans-Arctic hop is regarded by aviation experts as more daring than Lindbergh's flight to Paris; Joe Crosson, who rushed the bodies of Wiley Post and Will Rogers to the States after their fatal crash at Point Barrow; Bob Reeve, the uncanny glacier flyer; and "the world's craziest pilot," Archie Ferguson. Her heroes are strictly those who "flew by the seat of their pants"—and still do—on missions that often are as amusing as they are amazing. Truly, there were, and are, giants in those skies—and this is their exciting story.

—PAUL FOUNTAIN

## SHORT VIEWS

**DIALS AND FLIGHT, by Assen Jordanoff. Published by Harper & Brothers, 49 E. 33rd St., New York 16, N. Y., in 1947. Price $5.**

Divided into four parts—Flight Instruments, Engine Instruments, Navigation Instruments, and Automatic Pilots—"Dials and Flight" devotes a chapter to each aircraft instrument, telling concisely how it is built, its function, location, as well as servicing instructions.

The book is liberally illustrated with full-page half-tones, line drawings, diagrams and charts stressing the important parts of the instrument. It would be a valuable addition to any flying enthusiast's library.

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**OPPORTUNITIES FOR ESTABLISHING NEW BUSINESSES IN AVIATION, prepared by Richard H. Rush, under the direction of H. B. McCoy, Director, Office of Domestic Commerce, U. S. Dept. of Commerce. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price 40c.**

This booklet was prepared in response to the thousands of requests for information on the various opportunities for establishing aviation business which deluged the Department of Commerce. It tells briefly the kinds of businesses in the field, qualifications necessary for success, financial requirements, as well as some general principles on how to establish the business and operate it profitably.

Men already established in these various types of aviation businesses were consulted and contributed to the booklet. [Further authoritative information on employment opportunities in the field of aviation will be made available to FLYING readers in a forthcoming article by Mr. Rush.—ED.] END

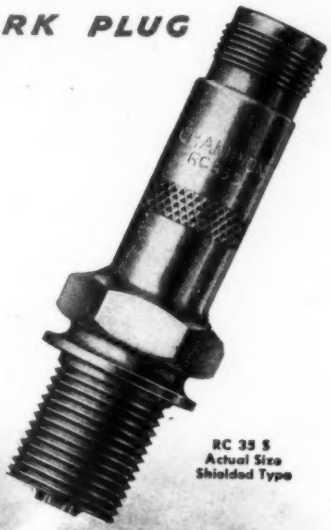
FLYING

"Let's hang around and see 'em go home!"

Dependable

# CHAMPION

AMERICA'S FAVORITE SPARK PLUG



RC 35 S
Actual Size
Shielded Type

C26—
Unshielded
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When the Navy's Patrol bomber "Truculent Turtle" set a world's non-stop long distance record in a flight of over 11,000 miles, it was equipped with Champion Spark Plugs. This flight from Perth, Australia, to Columbus, Ohio, provided another exceptional example of the outstanding dependability of Champion Spark Plugs. The name Champion and the word "dependable" are synonymous, a fact that has made it America's Favorite Spark Plug for aircraft engines. Champion Spark Plug Company, Toledo 1, Ohio.

*Listen to the CHAMPION ROLL CALL,*
*Harry Wismer's fast sportscast every Friday night, over the ABC network.*

**INSTALL CHAMPIONS AND FLY WITH CONFIDENCE**

# An Airliner Comes Home

(*Continued from page 24*)

each overseas flight, must be developed into a fine art. For illustrations, AOA operations last year tallied 1,059 trips (carrying 29,451 passengers) in and out of New York City alone. These statistics should be seen in light of the fact that two planes, a *Constellation* and a DC-4, were usually held "on standby" in case of unexpected delay. But the hitherto unheralded part of that record is that it involved also an equal number of "turn around" maintenance-inspections.

Such inspection procedure is based on minimum standards set up by the Civil Aeronautics Administration. Using these minimums, each airline determines its own maintenance standards which differ only with respect to policies and techniques.

Normal maintenance and inspection on AOA planes (even on those which require engine change and subsequent test hops), is expected to take not more than 24 hours. All scheduled AOA stops are at bases equipped to do any repair work required during a scheduled flight. The main terminal at La Guardia Field, however, handles major "turn-arounds." Here's a brief summary of how this system is set up.

Before each passenger-carrying overseas flight originating in the U. S., each plane receives a "No. 1 Inspection (Supplement)." In addition there are cumulative periodic inspections performed at each 120-, 240-, 400- and 800-hour interval. At European terminals a basic No. 1 inspection is performed before each plane makes its return flight. At all stops between main terminals the plane is given an "in transit" inspection to check any flight defect which the trip itself may develop.

During the No. 1 Supplement, 39 items and assemblies are checked on a DC-4—eight groups and types of instruments, 20 systems and accessories on each of its four engines, and eight electrical installations are tested or inspected for airworthy condition. In addition, a "final check-out" lists three general items, 12 exterior wing points, 24 items on the flight deck, six items in the crew's quarters, 12 items in the main cabin and two in the tail compartment that require detailed inspection. The Lockheed *Constellations* require proportionately more work because of their larger size. Just starting the engines—after all the foregoing inspection—includes 18 more checks prior to run-up. And there are 10 pre-departure and 31 run-up checks which must be made.

Every imaginable precaution is observed. For instance, all crew complaints are extracted from the previous trip's flight log and entered on a flight complaint sheet that accompanies the airplane throughout inspection. And when all maintenance work is finished a "Termination Check Sheet," listing all flight and ground operation complaints, has to show corrective action on every defect reported. Such a maintenance system is neither small nor inexpensive. At AOA's La Guardia Field shops, the latest available figures for March, 1947, show that the No. 1 Supplement inspections required an average of 320.5 man-hours on each DC-4, or a labor-cost average of $490.36 on each plane. All material and parts costs are extra and while this man-hour average includes all cleaning, repair and shop work, it does not include cabin service or communications work.

At the same time that maintenance work of the No. 1 Supplement is being done the cabin-service department has a three- or four-person crew cleaning and checking all interior equipment. They remove all used supplies and install clean blankets, pillows and pillow cases, head rest covers, life jackets and oxygen masks. The crew also is responsible for maintenance of a medical kit complete enough to be used in case of an emergency birth aboard the plane, and three 15-man life rafts. Purser's and stewardess's supplies and promotional and instructional literature must be provided.

As for the additional inspections, No. 2 (at each 120 hours) requires an average of 388.9 man hours; No. 3 (each 240 hours) requires 504.2 man hours; No. 4 (each 400 hours) takes 529 man hours and the No. 5 at each 800-hour interval takes 610.9 man hours—each figured to include previous periodics and the No. 1 Supplement. That may sound like work requiring days to complete. Actually, the AOA shops at La Guardia are on a 40-hour work week, with a three-shift system that keeps things humming around the clock. Even the longest inspection and repairs are scheduled for completion by the third shift in something less than 24 hours elapsed time between flights. The No. 1 Supplement is listed for a maximum of 12 hours under maintenance control but generally requires an average of only five hours to complete. No. 2 is listed for 16 hours, No. 3, 18 hours; No. 4, 20 hours and No 5, 24 hours. As soon as any inspection is completed the airplane is moved out on the line in readiness for departure on its scheduled run.

The turn-around at the European terminals of American Overseas Airlines is performed at bases staffed by AOA personnel at London, Frankfurt and Berlin. Turn-around at Stockholm is performed by AOA personnel using the shops and facilities of ABA, the Swedish airline member of the Scandinavian Airlines System. At these terminals any major work necessary is performed before a plane leaves on its return flight to the U.S. During the "in transit" inspections made at way stops, which take an average of about four man-hours each, any operational defects which might affect airworthiness of the plane are corrected. Repairs are postponed on defective equipment which does not affect airworthiness until the plane reaches La Guardia.

Even this enumeration of inspections, repairs and services is only one mechanical aspect of the entire "turn around" sequence. From an airplane's arrival until its next departure every one connected with the airline is involved in one connected duty or another—all aimed at greater safety in operation, increased economy of time. That's why, any time you board an American plane for an overseas flight you'll be getting the finest --and the safest—aviation service in the world. END

FLYING

"Y'know, George—for a minute I didn't think you'd make it!"

# FLY TO THE *Jersey Shore*

Handy to fishing, bathing, golf, boardwalk, and all the fun of the Jersey Shore is the modern Monmouth County Airport, located just four miles from the Atlantic, serving the Shore from Long Branch to Bay Head. A fine, up-to-date airport, Monmouth County offers these facilities for you and your plane:

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**Complete plane repair service by skilled, efficient mechanics — everything from a minor adjustment to a major overhaul.**

**Three runways, two paved at 3700 feet. Field equipped for night flying, 24-hour gasolene service.**

**CAA-approved Flight School.**

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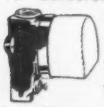
## ALL BRAND-NEW BARGAINS

| Item | List Price | OUR PRICE |
|---|---|---|
| 1. Beautiful, well-made flying suit, gabardine, sizes 36, 38, 42, 44. | $17.50 | $7.20 |
| 2. Seat Cushions for BT-13's and AT-6's. Complete set, 2 seats and 2 backs, per set | 27.50 | 11.95 |
| 3. Daco-Lite emergency flashlight, generates own current, needs no batteries | 4.50 | 2.35 |
| 4. Prop Spinners, highly polished spun aluminum, all sizes: | | |
| 50-65 hp light planes | 3.00 | 1.75 |
| Cub, Stinson, Luscombe | 3.00 | 2.15 |
| PT-19 | 5.00 | 3.00 |
| Fairchild, 200 hp | 5.50 | 3.66 |
| Stearman, PT-17 | 6.00 | 3.70 |
| Ryan | 7.00 | 5.50 |
| 5. Navy Type S Summer Flying Suit, cool and handsome, sizes 36, 38, 40 | 22.95 | 11.95 |
| 6. Sunglasses, Cal-Ray Skyway Jr. ophthalmic-quality ground and polished lenses, gold-filled frames, and leather case | 12.50 | 7.75 |
| 7. Polaroid Flying Goggle Kit, with green, amber and blue interchangeable lenses | 8.50 | 3.45 |
| 8. Identification Bracelet—every flyer should have one. Sterling silver pilot wings and heavy chain, curved to fit wrist | 4.50 | 2.98 |
| 9. B-4 Bag, commercial version of famous AAF bag, fine quality Forest Green simulated leather with heavy zipper (add Fed. tax) | 25.00 | 17.95 |
| 10. A-2 Flying Jacket, finest quality rayon-lined soft brown horsehide, sizes 38, 40, 42, 46, 48 | 27.50 | 19.20 |
| 11. Model A-760 Starter Tester, the essential tool for testing clutch settings on engines up to 1000 cu. in. displ. (literature available) | | 225.00 |
| 12. Carburetor, NAR6, for Cont. W-670 (R-670-5) | 203.00 | 65.00 |
| 13 Carburetor, NAR7A, for Lycoming and Jacobs | 280.60 | 65.00 |
|  14. No. 2PR-600CWT Fuel Pump, Type G-9 | 90.00 | 38.50 |
| 15. Parker Twin-Engine Primer | 18.00 | 4.80 |
| 16. Vixen Spark-plug Cleaner, with special Crisilite abrasive | | 5.75 |
| 17. No. 63-46015 BT-13 Tailwheel Shock Strut | 117.60 | 12.50 |
| 18. Pliofilm Engine Envelopes, AN-4068-1 for Ranger V-770 | 9.60 | 4.75 |
| AN-4070-1 for Wright R-760 or Jacobs R-755 | 9.60 | 4.75 |
| AN-4071-1 for Wright R-975, P&W R-985, P&W R1340 | 9.60 | 4.75 |
| AN-4072-1 for Wright R-1820 or P&W R-1830 | 10.20 | 5.00 |
| AN-4073-1 for Wright R-2600 or P&W R-2800 | 10.80 | 7.50 |
| AN-4074-1 for Allison V-1650 or V-1710 | 12.00 | 7.50 |

## WAR SURPLUS SPECIALS

| Item | List Price | OUR PRICE |
|---|---|---|
| 19. C-12, C-13, C-14A Sensitive Altimeter, new | $120.00 | $24.00 |
| 20. D-6, D-7, F-1, F-2 High-range Airspeed Indicator, new | 65.00 | 24.00 |
| 21. A-5, A-8, A-11 Turn and Bank Indicator, new | 84.00 | 21.00 |
| 22. A-6, A-7 Rate of Climb Indicator, new | 91.80 | 21.00 |
| 23. AN-5735-1 Directional Gyro Indicator, Type A, new | 288.00 | 38.50 |
| 24. B-3, B-4 Directional Gyro Indicator, Type B, new | 336.00 | 38.50 |
| 25. AN-5730-2A Remote Indicating Magnetic Compass, new | 135.60 | 36.75 |
| 26. F-2, F-4 Diaphragm-type Suction Gage, new | 15.00 | 2.65 |
| 27. B-7, B-9, B-11 Cylinder Head Temperature Indicator, new | 38.40 | 4.80 |
| 28. Tachometer Generator, any type, new | 38.50 | 9.45 |
| 29. C-2 Fuel Pressure Warning Signal, new | 35.00 | 1.75 |
| 30. G-1 De-Icing Pressure Gage, new | 11.40 | 1.55 |
| 31. C-10 Fuel Pressure Gage, new. | 13.80 | 1.55 |
| 32. C-14, C-14A Fuel Pressure Transmitter, new | 48.00 | 14.00 |
| 33. D-2 Manifold Pressure Gage, new | 18.00 | 3.85 |
| 34. E-1, E-3, E-4, F-1 Hydraulic Pressure Gage, New | 12.60 | 1.20 |
| 35. R-17-V-800, R-17-V-1450, R-17-V-802 Voltammeter, new | 14.40 | 3.75 |
| 36. AN-5525-2 Resistance Bulb, long, new | 10.00 | 1.45 |
| 37. E-1 Elec. Heated Leather Gloves, used, per pr. | 11.88 | 1.18 |
| 38. F-2 Elec. Heated Gauntlet Gloves, new, per pr. | 12.00 | 2.17 |
| 39. F-1 Complete Electrically Heated Flying Suits, jacket and trousers, new (specify size) | 32.76 | 6.00 |
| 40. Same Flying Suit, used (specify size) | 32.76 | 3.27 |
| 41. Shoes to match, new (specify size) per pr. | 6.12 | 1.23 |
| 42. Portable Instrument Test Set, repairable condition | 800.00 | 200.00 |
| 43. Heavy-duty Engine Stud Driver and Remover Kit (Navy R41-K-139) used | 71.00 | 35.63 |
| 44. Torque-meter Wrench, ½" sq. drive, 2400 in. lb. capacity, (Navy R41-W-3573) used | 21.50 | 11.87 |

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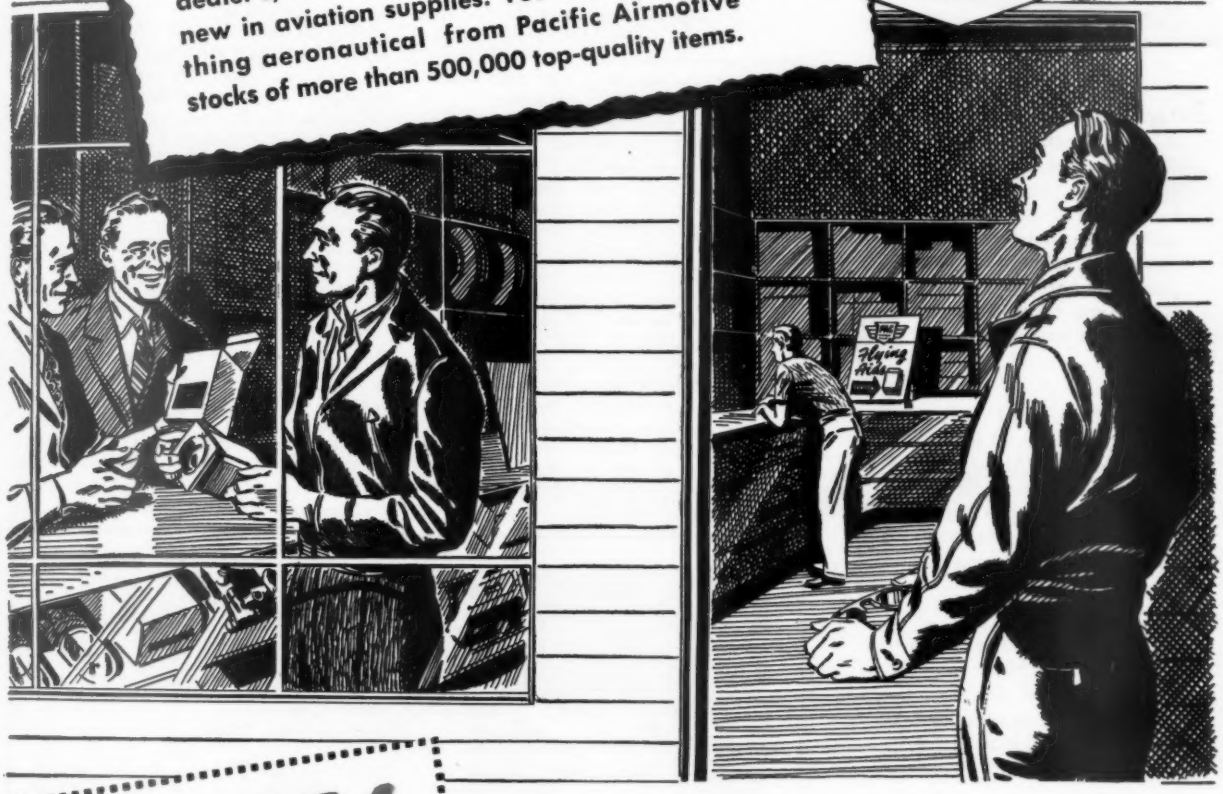

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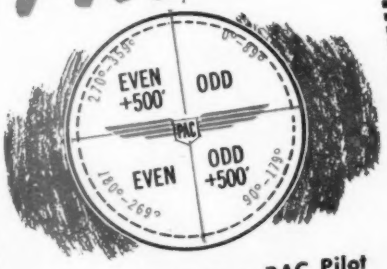


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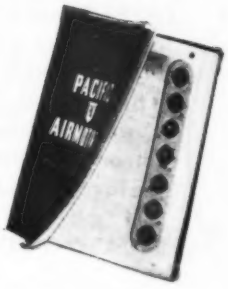

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## Pancake Lightplane

(*Continued from page* 34)

down conveniently in your backyard.

Zimmerman's patented model is so designed that the pilot and passenger would have to lie prone. However, the XF5U has a cockpit in which the pilot sits upright. The same change could be made in a civilian wing, at some extra cost.

Another objection to the wing is that it would drop like a rock if there were engine failure when it was hovering. Zimmerman denies this. You can handle a stall exactly the same way you would in a conventional plane, he says.

Indeed, the inventor adds, if you have a conventional license you can fly the wing after a test hop as if it were another conventional craft. Additional instruction would be needed to master its hovering characteristics but it is easier to fly than a helicopter.

"Longitudinal control in hovering," says Zimmerman, "is accomplished with the elevator surface at zero forward speed by rotating the flap nearly to its extreme upward position." The machine will even go backward slowly if you set the elevator to its upward limit. "Whether the machine rises, descends, or neither, depends on the throttle and propeller pitch setting at the particular elevator setting. For example, with the throttle and elevator set for slow cruising speed in level flight the machine will rise if the elevator is raised slightly. But after further movement of the elevator, the wing will maintain level flight at considerably slower speed. Further upward movement of the elevator will cause the machine to descend with a still lower forward speed."

Landings are made tail low. When the wheels touch, you throttle the engine so that the front gear sinks and touches.

Using the rudders, the plane can also be moved sideways.

What all this is going to add up to in terms of a plane that you can buy and set down in your back yard is, at the moment, a moot question.

Word from our New York correspondent, John Lancaster, is that Chance Vought takes a dim view of the aeromobile's peacetime possibilities. Chance Vought officials say that they have not publicized Navy's XF5U for security reasons, although—while withholding certain performance data—Navy has no security on the plane and has released pictures and stories about it.

Chance Vought, meantime, has said nothing about peacetime possibilities and there is no information on what they are doing toward developing civilian models.

Zimmerman still holds the patent on the wing and, after nearly 15 years of working on it, may be assumed to be more than casually interested in seeing a civilian model on the market. END

## BLOCKBUSTER PILOT

ED WILSON, of radio station KWK, St. Louis, is a test pilot of sorts. Friends jest, "if Ed can get my plane to hoist his 300 pounds, it's bound to be airworthy."

Wilson, who began both his radio career and flying 14 years ago, now flies his own floatplane along the Mississippi River—whenever he's not MC'ing one of his folksy radio programs or one of the region's many air shows. Passengers are often Daughters Judy, Jane and Kathie—ages seven, three and two.

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$1.80 of each year's dues are for my subscription to the AOPA Edition of FLYING

# The Piper PA-11

(*Continued from page* 51)

below, yellow on top. Then, she's got an entirely new nose. The engine is neatly encased in a pressure cowl. The gas tank is gone from in front of the windshield; it's up in the left wing center section, and it carries 17 gallons now. There's plenty of leg room, the windshield is much deeper, and, of course, the visibility is better. The landing gear, shock absorbers, wing struts, wing—everything outside has been cleaned up to the point where the PA-11 gave me an honest 86-m.p.h. ground speed on a round-trip cross-country flight.

And inside, well, you'd hardly know the old girl. All the controls and knobs are in the same place (except the carburetor heat, which has been moved over to the left-hand cabin wall), and the instruments and controls are the same. But from there on there's been a new deal. The seats have leatherette-covered cushions and backs—and the cushions you sit on are foam rubber. The back of the front seat is hinged so that you now only have to be an average gymnast to climb into the front seat, instead of a professional acrobat. The hinged back has a spring that snaps the back upright when you let go.

Piper engineers also came up with a minor revolution by moving both seats back several inches, and raising the front seat two inches higher off the floor. The result is that, for the first time in the history of the *Cub*—hold your hats, fellows—you can fly it solo from the front seat! I enjoyed that sensation so much

**HOW THEY COMPARE**

**One 65-h.p. air-cooled Continental engine**

| Specifications | PA-11 | J-3 |
|---|---|---|
| A.T.C. number | 691 | 691 |
| Wing span | 35′ 2½″ | 35′ 2½″ |
| Length | 22′ 4½″ | 22′ 4½″ |
| Height | 6′ 8″ | 6′ 8″ |
| Gross wt. (lbs.) | 1,220 | 1,220 |
| Empty wt. (lbs.) | 730 | 680 |
| Wing loading (lbs. sq. ft.) | 6.8 | 6.8 |
| Fuel cap'y. (gals.) | 17 | 12 |
| Baggage (lbs.) | 20 | 20 |
| Top speed (m.p.h.) | 100 | 83 |
| Cruising speed (m.p.h.) | 87 | 73 |
| Max. range (miles) | 328 | 195 |
| Ceiling (feet) | 16,000 | 12,000 |
| Rate of climb loaded (f.p.m.) | 514 | 450 |
| List price (f.a.f.) | $2,445 | $2,195 |

Source: Piper Aircraft Corporation

I flew the Tufts-Edgcumbe demonstrator (NC-4527M) around the countryside for more than two hours. What's also refreshing is the fact that, when I landed back at the Tufts-Edgcumbe field at Elmhurst, Ill., I still had well over an hour's gas left in the PA-11's tanks.

When I flew the PA-11 it weighed just 150 pounds under maximum gross weight. With a 15-m.p.h. surface wind the take-off startled me. After a few tries I found I could almost move the throttle forward and the stick back in one simultaneous motion. I timed one take-off and found I was getting about 700 f.p.m. Once I got the hang of it, I was climbing out of the airport at an indicated air speed of 60 m.p.h. and going up so steeply that everyone on the field stopped to watch. At one time I noticed that I had 600 feet of altitude as I passed over the edge of the field (its longest runway is 2,600 feet).

Despite the fact the PA-11 retains the two-section door of the J-3, the newer model is considerably more comfortable for flying, even in the coldest weather. These large doors, which make the *Cub Special* ideal for aerial photography, now have rubber weather-stripping. This, and the fact that the new heater throws plenty of heat to both seats, makes the PA-11 quite snug. I flew it for a while in shirt sleeves, though the outside temperature was in the low 40's.

In her new, slicked-up form, the *Cub Special* is quite acceptable for short cross-country trips. The comfortable new seats, increased leg room, quieter cabin and the higher cruising speed have put a new light on this business of flying *Cubs* on trips that extend outside the airport traffic pattern.

I made good that 86 m.p.h. average ground speed by cruising at 2,200 feet above sea level, using the standard 2,100 r.p.m. Indicated air speed stayed between 85 and 90. The 65-h.p. Continental purred along quietly, although it seemed especially vulnerable to carburetor ice, despite the fact that the weather bureau was reporting the temperature at 44° and the dew point 27. I finally ended up flying with the carburetor heat full on all the time.

Only thing about the PA-11 that consistently disturbed me was the fact that those two large pieces of metal tubing still form a V directly in front of the pilot's face, right behind the windshield. Result is that, despite the deeper windshield, you can't lean forward to look around without getting your head caught in the V. So you just don't get the chance to use that added visibility as much as you'd like.

With the PA-11, maneuvering on the ground is no longer a version of blind man's buff. Sitting in the front seat, and with the engine mounted four inches lower than in the J-3, you can easily see out in front; the days of constant S-ing while taxiing are gone. Just give her the gun and taxi where you're looking, using the steerable tail wheel and heel brakes to help.

And maneuverability in the air also is an improvement over the J-3. The PA-11 seems more stable, quicker on the controls, yet has all the safety characteristics of its predecessor. I stalled the new *Cub* a number of times, and there was no tendency to fall off out of control.

But all these improvements cost money, hence the new price of the *Cub Special:* $2,445 f.a.f.

—Max Karant

# CHART CALENDAR

ONE of the private pilot's most important navigational aids is the sectional aeronautical chart. Because they are so important, FLYING publishes a corrected listing each month.

Charts can be purchased for 25 cents each from the Coast and Geodetic Survey, Washington 25, D.C., or from one of its many authorized agents throughout the country.

SECTIONAL

| Map | Date | Minor Change | Map | Date | Minor Change | Map | Date | Minor Change |
|---|---|---|---|---|---|---|---|---|
| Aberdeen | Dec. 11, 1945 | Nov. 23, 1946 | El Paso | July 25, 1946 | Jan. 17, 1947 | Norfolk | Oct. 23, 1946 | |
| Albany | Jan. 7, 1947 | | Fargo | May 29, 1946 | Nov. 21, 1946 | Oklahoma City | Sept. 23, 1946 | |
| Albuquerque | Mar. 7, 1947 | | Glacier Park | Oct. 30, 1946 | | Orlando | Feb. 13, 1947 | |
| Aroostook | Dec. 31, 1946 | | Grand Canyon | Mar. 11, 1947 | | Phoenix | Mar. 3, 1947 | |
| Austin | Jan. 28, 1947 | | Grand Junction | Mar. 11, 1947 | | Pocatello | Nov. 3, 1946 | |
| Beaumont | Jan. 28, 1947 | | Green Bay | June 12, 1946 | Dec. 9, 1946 | Portland | Oct. 25, 1946 | |
| Bellingham | Oct. 22, 1946 | | Huntington | Oct. 9, 1946 | | Prescott | Mar. 5, 1946 | Sept. 3, 1946 |
| Birmingham | Apr. 11, 1947 | | Jacksonville | Feb. 7, 1947 | | Rapid City | Nov. 13, 1946 | |
| Boise | Apr. 30, 1946 | Oct. 25, 1946 | Kansas City | Mar. 28, 1947 | | Reno | Feb. 17, 1947 | |
| Boston | Jan. 14, 1947 | | Klamath Falls | Nov. 7, 1946 | | Roswell | Sept. 16, 1946 | |
| Burlington | Dec. 31, 1946 | | Kootenai | Oct. 28, 1946 | | Sacramento | Feb. 16, 1947 | |
| Butte | May 15, 1946 | Nov. 8, 1946 | La Grande | Oct. 29, 1946 | | Salina | Mar. 15, 1947 | |
| Casper | Nov. 7, 1946 | | Lake Huron | Dec. 28, 1946 | | Salt Lake City | Nov. 7, 1946 | |
| Charlotte | Oct. 25, 1946 | | Lake Superior | June 13, 1946 | Dec. 3, 1946 | San Antonio | Jan. 28, 1947 | |
| Chattanooga | Oct. 25, 1946 | | Lake of Woods | May 25, 1946 | Nov. 19, 1946 | San Diego | Feb. 26, 1947 | |
| Cheyenne | Nov. 21, 1946 | | Lewiston | Jan. 8, 1947 | | San Francisco | Feb. 21, 1947 | |
| Chicago | Dec. 24, 1946 | | Lincoln | Dec. 3, 1946 | | Savannah | Oct. 25, 1946 | |
| Cincinnati | Oct. 25, 1946 | | Little Rock | Mar. 19, 1947 | | Seattle | Oct. 23, 1946 | |
| Cleveland | Jan. 7, 1947 | | Los Angeles | Feb. 25, 1947 | | Shreveport | Sept. 16, 1946 | |
| Corpus Christi | Feb. 4, 1947 | | Miami | Feb. 28, 1947 | | Sioux City | May 31, 1946 | Nov. 23, 1946 |
| Dallas | Mar. 21, 1947 | | Miles City | May 13, 1946 | Nov. 12, 1946 | Spokane | Oct. 23, 1946 | |
| Del Rio | Jan. 22, 1946 | Jan. 30, 1947 | Milwaukee | Dec. 31, 1946 | | Trinidad | Sept. 16, 1946 | |
| Denver | Mar. 11, 1947 | | Minot | June 6, 1946 | Nov. 19, 1946 | Tulsa | Mar. 26, 1947 | |
| Des Moines | Dec. 13, 1946 | | Mobile | Feb. 3, 1947 | | Twin Cities | May 31, 1946 | Dec. 6, 1946 |
| Detroit | Dec. 31, 1946 | | Mt. Shasta | Oct. 25, 1946 | | Washington, D.C. | Oct. 22, 1946 | |
| Douglas | Jan. 14, 1947 | | Mt. Whitney | Feb. 21, 1947 | | Wichita | Mar. 5, 1946 | Sept. 16, 1946 |
| Dubuque | Oct. 2, 1945 | Dec. 12, 1946 | Nashville | Oct. 13, 1946 | | Williston | Nov. 1, 1946 | |
| Duluth | Jan. 8, 1946 | Nov. 28, 1946 | New Orleans | Jan. 23, 1947 | | Winston-Salem | Oct. 2, 1946 | |
| Elko | Nov. 1, 1946 | | New York | Jan. 9, 1947 | | Yellowstone Park | Nov. 1, 1946 | |

LOCAL

| | | | |
|---|---|---|---|
| Brownsville | Jan. 29, 1947 | New York & Vicinity | Aug. 6, 1946 |
| Los Angeles | Mar. 4, 1947 | San Diego | Mar. 18, 1947 |
| Miami | Feb. 13, 1947 | Seattle | Nov. 28, 1946 |
| | | Washington | Nov. 7, 1946 |

**The various minor changes indicated are not of sufficient importance to make the previous print obsolete. All charts carrying dates previous to those shown in large type on this list are obsolete for use in flight.**

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When you take to the air, a wide selection of personal planes is available. Their variations in speed, range, power and passenger capacity permits the choice of a plane to fit your business or personal requirements. Most of these planes are powered with Continental Red Seal aircraft engines.

POWER BY Red Seal Engines CONTINENTAL

# Who's Afraid of Thunderstorms?

(*Continued from page* 44)

torn apart, being flipped over on their backs by the sharp gradients between steep updrafts and downdrafts, of pilots gaining altitude while trying to dive, or of being blown tail first out of the top of a thunderhead?

They're probably brought about by the pilot's mishandling of the plane, in the opinion of Dr. Horace R. Byers of the University of Chicago, who is director of the Thunderstorm Project, and of Roscoe R. Braham, himself a four-engine pilot who is in charge of the analysis section of the Project for the U. S. Weather Bureau.

They are convinced that if extreme accelerations have been noted in thunderstorms it is because pilots have pulled them themselves. A pilot might be in a downdraft, for example. Watching his rate of climb indicator or his altimeter he would pull more and more stick. When he finally hit good solid air it might twist a spar or break off a wingtip. As far as he is ever afterward concerned, the storm is to blame, not himself. In one case a pilot unknowingly let himself get upside down in heavy turbulence. He tried to correct decreasing altitude in a downdraft by pulling back on the stick. This, of course, dove him into a critically high airspeed before he could realize what was wrong.

In all the flights made by the Thunderstorm Project last summer no turbulence was found sharp enough to flip a plane over on its back without regard for what the pilot might be trying to do. An alert, well-trained instrument pilot in a well-instrumented ship could combat even the worst conditions encountered. There were no great changes in altitude due to updrafts and downdrafts. There was no evidence to show that any plane and pilot thoroughly equipped for instrument flying could not have gone through the storm.

The hazards, in other words, have been mostly psychological. Every passenger knows that thunderstorms are rough. But there has been so much emphasis on their dangers that pilots have been afraid of them. The scare approach puts pilots in the wrong frame of mind. What's needed is to build up confidence in flying storms.

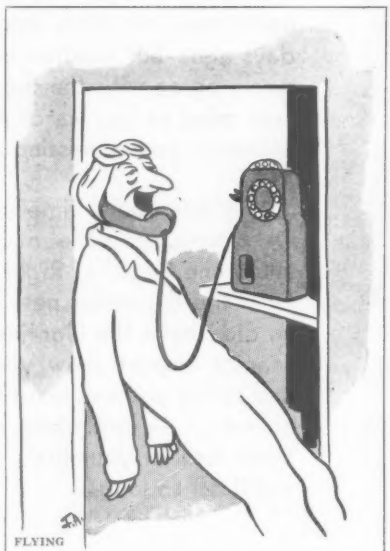
All of the thunderstorms flown last year were in Florida and represented the pure convection type not associated with weather fronts. The scientists believe that they may find slightly more extreme turbulence in cold front situations which they are investigating over Ohio this summer, but they still refuse to subscribe to the "scare" theory.

The 12 Army Air Force pilots who volunteered to fly their planes for the Thunderstorm Project were all former instrument instructors at Bryan Flying School. They came down to Florida last summer in the state of mind that might have been expected of young men who had been told all their lives that if they poked their noses into a black cloud they most probably would get them cut off.

But not one of them is afraid of storms any longer.

The Thunderstorm Project has found out more than that thunderstorms are safe (though turbulent) for instrument pilots. It has discovered something about the structure of thunderstorms that indicates they may be flown in the future without any danger or even very much turbulence. All that is now needed is a new kind of flight instrument which will give the pilot the correct sort of information.

The weathermen have found, for instance, that thunderstorms are composed of cells. There may be one or several cells in the same convective cloud. A full grown cell usually takes the form,




"I just got in . . . Boy am I tired!"

horizontally, of a lopsided circle or an ellipse whose largest dimension is approximately seven miles. In height, these cells extend from a few thousand feet for those just starting to build, to more than 40,000 feet for those that have reached their peak.

The importance of this is that between these cells there are areas of no turbulence—sometimes several miles in length. You can't see these when you're flying within the storm, and radar doesn't show them. But Dr. Byers believes that it is just a question of time before an instrument can be developed which will show the areas of turbulence and relative calm. Perhaps it will be an electronic instrument, perhaps it will utilize infra-red waves. But he is confident that it will be developed. One purpose of the Thunderstorm Project has been to learn what is needed. Now instruments makers know what to work for.

The Thunderstorm Project is under the direction and co-ordination of the U.S. Weather Bureau, with the Army Air Forces, U.S. Navy, NACA, and the University of Chicago participating. All field operations last summer were conducted at Pinecastle, Fla., near Orlando Army Air Base. All thunderstorms surveyed were of the air mass type found in Florida during the summer. This summer, field operations will be conducted in Ohio.

The flight surveys were made by Northrop *Black Widows*, big rugged planes originally built as night fighters. The five airplanes were under the direction of a radar ground controller. On the basis of ground radar observations of the storms, the planes were directed to make nearly simultaneous traverses of the storms at altitudes of from 6,000 to 26,000 feet. There were approximately 5,000-foot vertical intervals between each plane. During the flights measurements of atmospheric turbulence were taken. Accelerometers, airspeed-altitude recorders, and control position recorders helped measure gust velocities.

At the same time, detailed surface measurements of meteorological conditions during the storms were taken from a network of 55 stations over an area only about 7x15 miles in size.

Autopilots were removed from all the *Black Widows* as being too sensitive. Entry into the storm was made at slightly below cruising speed. The planes were trimmed for level flight. Pilots were instructed to use a minimum of corrective controls on the theory that airplanes are inherently stable and that if a gust tipped up one wing the next gust would tip it down. The results of these 550 storm flights are comforting to pilots who get caught in thunderstorms.

There were no structural failures of any kind.

There were no excessive losses or gains in altitude.

The lower man in the vertical stack had to use more control simply because he was closer to the ground, but his flights were as successful as any of the others.

The danger of flying thunderstorms has been vastly over-emphasized.

Data so far indicates that thunderstorms are a much more orderly process than pilots have been led to believe. This orderly process has been observed in all storms so far surveyed. The assumption is that storms not surveyed follow the same pattern.

The history of the thunderstorm cell is divided into three parts by Braham. In a paper presented at the American Meteorological Society in Washington, April 29, he described these stages:

DEVELOPMENT STAGE. The vertical currents are all upward and appear to be uniform through any horizontal plane of the storm. The currents usually increase with height. Such conditions apparently persist until the drop coagulation reaches such proportions that the rising air current can no longer carry the increasing amount of water. The maximum weight of water is near the sides of the cell. As the liquid water begins to fall through the ascending air currents, it soon localizes and the downdraft becomes well established. At this point the cell passes into the peak stage.

PEAK STAGE. There is no longer a universal updraft. The lower portion of the

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**J. WAYDE STEWART** got his start in aviation in 1923. Although too young to accept a commission, he attended Officers' Training School at Chanute Field in Illinois. In 1932 he started private flying and in 1936 bought the Parkersburg Municipal Airport.

Mr. Stewart has been Treasurer of First Region, National Aviation Trades Association; conducted Civilian Pilot Training programs before the war and War Service Training programs during the war with one of the largest schools in the country. He is also distributor for ERCOUPE in West Virginia—Kentucky—Ohio and dealer for North American "Navion."

J. Wayde Stewart, knowing aviation from the ground shops to the planes in the air, prefers Esso Aviation Products . . . because he likes things RIGHT . . . and knows he gets *right service* backed by *right quality* and *right aviation research* with ESSO AVIATION PRODUCTS!

storm contains both a major updraft and a major downdraft. At the base of the storm the two drafts are spread over about the same amount of area, with the maximum updraft near the leading edge of the cell and the maximum downdraft occurring with the rain in the central and rear portions. With height, the downdraft increases both in speed and volume, and the updraft usually increases. In the upper third of the cell there is only updraft. The cell changes shape from the circular horizontal cross-section to a pear-shaped cross section with the updraft in the larger end and the downdraft in the smaller end. By the time the downdraft area at the base of the storm exceeds the area of the updraft, the cell passes into the dissipating stage.

DISSIPATING STAGE. The predominant structural feature is a downdraft at all but the highest altitudes. The speed of the draft is usually less than at the peak stage. The rain under the cell has decreased. The pear shape is now reversed with the largest ending containing the downdraft. As the updraft dies out the cell again becomes circular. Rain seems to be basic and it is believed that the downdrafts are caused and maintained by the rain. Divergent winds blow out of the rain areas—and consequently of the downdraft areas.

"Throughout the storm," Braham reports, "the gusts (smaller-scale turbulence) are found concentrated in the cells, with a definite minimum in the area between individual cells. In some cases the air between the cells is entirely devoid of gusts having vertical velocities exceeding two feet per second, the threshold figure."

Updrafts of over 80 feet per second (about 54½ m.p.h.) have been noted by the instruments. Braham and Dr. Byers doubt that they ever much exceed 100 feet per second—which is less than 70 m.p.h. Downdrafts seem to have less velocity. There seems to be no chance of a plane being damaged by getting caught between strong updrafts and downdrafts because the gradient between them is gradual, not sharp.

With all-weather flying nearing reality, thunderstorm flying is bound to become necessary. Planes can't fly around entire fronts and, furthermore, an airplane at 30,000 feet requires 100 miles for a let-down. If thunderstorms are in the way they can't always be avoided, especially near terminals.

Last year's observation was made by the Army Air Forces Proving Ground Command. This year the Air Materiel Command will be in charge at the Clinton County Army Air Field, Wilmington, O., where the All Weather Flying Division under Col. J. M. Gillespie is located.

Here the Project will study typical cold front thunderstorms, which are often regarded as the most violent of all, and the night thunderstorms so frequent in the midwest. To distinguish between them, the air mass thunderstorms of Florida are largely the result of the hot sun heating the air which rises over a large area. When the air has risen high enough and cooled sufficiently, clouds become visible. Continuing to rise, the clouds become cumulus in form and eventually cumulonimbus or thunderheads. In cold front thunderstorms, the warmer surface air is forced aloft by a rather steep wedge of cold air moving in as a front. The lifted air undergoes a process of cooling which forms thunderstorms just as in the air mass type. The steeper the cold front, usually the more violent the storm. Warm front thunderstorms are caused when a mass of warm air overrides a mass of cold air which is already present. Because the gradients are more gradual, warm front thunderstorms are usually less violent and usually have a shielding layer of cold air beneath them which is less turbulent. Still another type, orographic thunderstorms, are caused by warm air blowing over a range of steep hills or mountains.

It is possible, of course, that the cold front thunderstorms or the night thunderstorms of Ohio may differ in pattern from the air mass thunderstorms of Florida which have already been investigated.

Braham and Byers don t think so. They believe that this summer's work will answer beyond any doubt the fears and uncertainties of pilots. They expect to counter with facts the pseudo-scientific fears and prejudices which had obscured the thunderstorm problem. When they accomplish this, aviation will be another mile along on its way toward safer, easier flying. END

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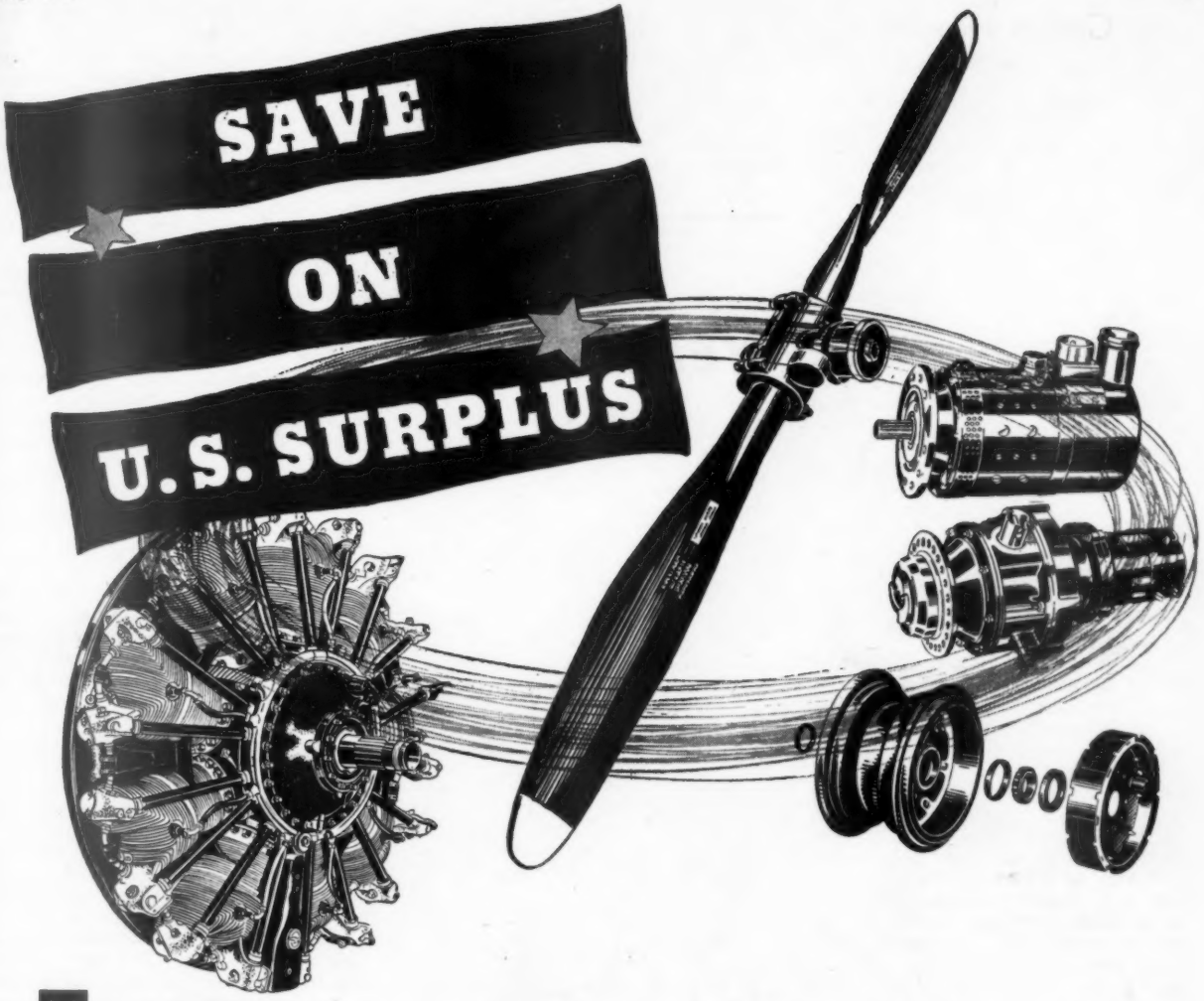


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# Gadget Heaven

(*Continued from page 36*)

saved the AAF an estimated 119 lives normally lost in routine flight training accidents, and $25,855,684 in combat equipment costs. It costs only $10 per hour to train the eight crewmen of a patrol plane in a synthetic trainer compared with over $200 per hour in the plane itself.

A year ago, Special Devices was moved from crowded quarters in Washington to the 163-acre Guggenheim estate north of Port Washington. Here, administration is carried on in the castle-like mansion that once belonged to Howard Gould, while the trainers themselves are built and operated in what was once the Romanesque style stables.

Here naval officers and civilians are working to solve the problems of tomorrow's planes. The wide range of research includes armament, computer equipment, crew co-operation, photography, flight, human engineering, navigation, radar and communications, and visual design. Many of these sections interlock on a single project.

They are demons for simplification at Special Devices. They have discovered, for instance, that flying a modern Navy fighter requires 350 separate and distinct moves from buckling the parachute belt to pulling back on the stick. Amidst all these distinct activities, pilot error or "pilot confusion," as it is called by Lieut. Comdr. George Hoover, USN, chief of the flight section, may occur sometime.

Hoover has worked on many improvements. A single new engine indicator, for example, combines six separate instrument faces. All a man need do is watch one square surface similar to a small radio face. Across the top of the new indicator are listed manifold pressure, r.p.m., fuel pressure, oil pressure, oil temperature, and cylinder temperature. Vertically, listed from the top, are take-off, climb, cruise, maximum cruise, glide, let-down. All the pilot need do is to watch a single horizontal line. If all is functioning properly, the line is solid. If something goes wrong, a segment of the line goes out of alignment. Malfunctioning thus becomes instantly apparent.

To teach students in the various flight trainers, the Navy uses two-sided phonograph records. One current combat plane requires 10 records on both sides merely to describe what's in its cockpit. The flight section wants to cut this down and the Fairchild XNQ standardized cockpit is a starter.

Many timing devices are also games. Pin-ball machines permit students to test their knowledge of naval aviation. Scoring mechanisms for gunnery training were put on the 3B6, Gunairstructor, and 3A2 trainers. Competitive gunnery students improved scores by 45 per cent.

Special Devices built a $200 collapsible planetarium. Holes were drilled in a 14-inch *blank* globe in relation to the position and magnitude of stars and constellations. A 1000-watt lamp was placed inside and it cast the stars' images through the holes upon a stretched canvas dome overhead. On this economical device eight students can study simultaneously celestial navigation anywhere in the world.

Special Devices also taught men to produce in eight hours a true scale three-dimensional model of any area to be attacked by use of raw materials at hand such as rags, sticks, weeds, etc. For a night attack the instructor takes the crews into a dark room, turns on a flashlight and familiarizes them with exactly what they will see on their mission.

Hoover's men know that the human being cannot jump from a 600 m.p.h. aircraft without being crushed to death by the enormous force of the slip stream. Even at 550 m.p.h. the ejection seat is risky. Thus a jettisonable cockpit like that of the Navy's new Douglas *Skystreak* may be the solution.

Another device is the contact flight trainer, operated in a special building near the former stables. Previous attempts at synthetic contact flight trainers have employed elaborate cycloramas or projection systems, requiring large buildings and intricate systems which made them impractical for general use.

This trainer is designed to train relatively experienced pilots in rocket launching, strafing, carrier approaches, and other operational techniques. Key to its operation is an optical device known as the "peritelengiscope," which makes it possible for the pilot to see an overhead relief map as though it were under his aircraft. Its periscope extension rotates and has a vertical motion simulating changes in altitude, direction, and inclination of the aircraft.

The cockpit resembles that of a *Hellcat*, mounted on a chassis which moves in response to the plane's controls. Through an eyepiece the pilot views the terrain and his instrument panel.

An aerodynamic computer unit on the cart controls all movements of the cart and optical system, causing the machine to "fly" just as an actual *Hellcat* would. While the student doesn't take-off or land, he can fly at varying speeds, altitudes, angles, pitches, rolls.

A monocular eyepiece attached to the optical unit enables the instructor outside the cockpit to view the terrain simultaneously with the student. Instructions can be transmitted to the student via a telephone hand-set connected with the trainee's earphones. Preset controls on an outside panel enable the instructor to set up any type of flight problem or actually to control the movements of the cart and optical system. The unit is electrically operated but mechanical computers are under development for use in other flight trainers.

New developments to be worked out include a rocket simulator for instruction on how to launch rockets.

Such trainers may be expensive initially but pay for themselves in a few months. A particular advantage is that the instructor is present—a condition impossible in most fighters. Others are time-saving, increased students per instructor, cheaper cost and increased safety.

Sands Point also has a primary landing trainer in which the student sits in a cockpit seat behind a model airplane controlled by a long mechanical arm. There are also a radio-controlled trainer with a beeper box, and another model airplane on a mechanical arm that can be made to take-off, fly, turn, bank, and land.

Special Devices began in April, 1941, as a desk in the engineering division of the Bureau of Aeronautics. By August, 1943, it became a division under Capt. Luis de Florez. It later fell under the Office of Research and Inventions in May, 1945, and de Florez was promoted to rear admiral. By the end of that year Special Devices had designed 500 different types of training equipment for the Navy, Army, and allied organizations. It may only now be hitting its full stride. END

## 15 YEARS AGO

FROM the July, 1932, issue of this magazine:

Stearman Aircraft had completed the *Beta;* an all-metal, low-wing, one-place airplane. Powered with a 300-h.p. *Wasp Junior*, it had a top speed of 204 m.p.h., landed at 66 m.p.h.

The Bordelaise A.B. 20, a French bomber powered with four water-cooled *Lorraine* engines, had been built by the Societe Aerienne Bordelaise. A flying-wing of 120-foot span, it had a double fuselage with deep-windowed links between the fuselages and a central nacelle. Carrying a 5,000-pound bomb load, the A.B. 20 cruised at 150 m.p.h., had a maximum speed of 165 m.p.h.

An all-metal, mono-wheel plane had been designed by Charles Hall, Farmingdale, N. Y. There were small caster wheels at outer wing tips for slow taxiing. At high taxi speed, the plane was borne on the single main wheel. Pilot's seat was to the right side of the fuselage; controls were suspended from the roof of the cabin.

A 'copter-type autogiro, eliminating the stub wings used in standard autogiros, had been built by Charles Ungerman, Jr. and George F. Miller of Los Angeles, Calif. The wingless craft got its lift entirely from the rotor. Powered by a 60-h.p. engine, the machine could ascend and descend along a nearly vertical line. It was built to sell for less than $1,000.

Kinner Airplane & Motor Corp., Ltd., introduced its 160-h.p., Model R-5. Weighing only 305 pounds, the new Kinner engine was the lightest aircraft engine of its power rating manufactured in the U. S.

An article, "Latest Rocket Planes for the Stratosphere," suggested a combination rocket and propeller system for stratospheric flight. Rocket discharge would be used to turn two conventional propellers at outset of flight. In higher regions, the propellers would be moved (by means of an adjustable bracket) away from the jet exhaust, and the plane would become a simple rocket-driven plane.

# Flying Fisherman

(*Continued from page* 43)

Their investigation resolved itself into a matter of simple mathematics. A man standing on the bridge of a tuna clipper, with the use of binoculars can scan the sea for a radius of five miles. If he climbs to the crow's nest, his range under conditions of normal visibility may be 6½ miles.

But from a plane flying at 1,000 feet directly over the vessel, an observer can see 30 miles on a clear day. Of course he must know how to interpret what he sees if he is to be of any particular service to a tunaboat.

Among other advantages it was noted during the *Liberator's* cruise that a "spotter" on a ship is handicapped by the sway of the vessel and by vibrations from its powerful Diesel engine. Accurate plotting often is impossible. But no such difficulties beset the spotter who uses a plane.

Speed in locating bait, catching it, and returning to the fishing banks while the unpredictable tuna are still snapping hungrily, is a prime factor in fishing success or failure. In this respect, the *Liberator's* plane soon earned its keep.

When the bait supply was low, or when fishing was slow, the seaplane crew would scan likely waters in search of sizeable schools, or "balls," of bait.

"We were able to find and put aboard bait in a matter of hours, where it took other ships days," Capt. George Soares reported. "Often the most experienced fishermen in the fleet will come close to a school of bait without realizing it. On one occasion, we headed in toward an island shoreline in the Galapagos and passed an outbound vessel piloted by a man who has plenty of fishing skill. He had given up in the search for bait and was headed toward other grounds.

"But when he saw us stop to put our plane over he stood by to watch McKusick sweep the shoreline," Soares recalled. "And sure enough, bait was located. The other boat put about, followed us, and picked up all the bait it needed."

Skepticism of other fishermen vanished. One skipper decided he could save a lot of time simply by following the *Liberator*. He did, to his advantage. The *Liberator* didn't begrudge sharing the information obtained by air reconnaissance. It enjoyed plenty of advantage, even so.

In bait spotting, for instance, the pilot's task was not ended after mere location of fish. "If he is enough of a fishing expert to analyze the character of the bottom off the islands," McKusick explained, "he can give valuable advice on how to set nets for bait without tearing them. There's plenty of jagged coral in the Galapagos and nets are one of the most expensive items of equipment carried on a fishing boat."

But time-saving accuracy remained the airplane's most valuable contribution on that first fishing trip. One day, McKusick found bait off one of the islands, and signalled the exact location by means of shallow dives. The *Liberator's* motorboat

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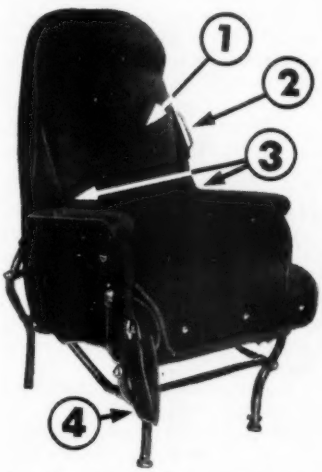


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and skiff proceeded to the area and the plane let down and anchored nearby. However, it soon became apparent that the fishermen had not found a sufficient supply of bait to make a set of the net.

"I took off again," McKusick said, "and discovered that they were within 75 feet of the main ball of bait but could not find it. From the time I signaled the original location until the boats arrived, the school had moved. The movement was easily distinguishable from the air, but not from the water."

Of course, observation from the air also could be fallible and, in the early stages of learning to spot the fish accurately, almost embarrassing. Often a shallow hole with weeds growing in it, peculiar cloud shadows, even large rocks and certain formations of coral were deceptive. But proper technique was developed quickly.

Once both George Soares and McKusick had scanned without success a long shoreline area when suddenly they came upon an area not far offshore that had the color of a school of bait several fathoms below the surface. However, the area was extremely large and gave the appearance of being the shadow along the edge of a reef. Even to Soares' experienced eye there was doubt and closer scouting was necessary.

"We circled again and again, watching closely for other telltale signs, but still couldn't be sure," McKusick said. "We landed and taxiied directly over the area and looked beneath the pontoons.

"Bait? It was black with bait! We couldn't believe a school of bait could be so large. To fix the scene in our minds, we again scanned it critically from the air. The school was fully a quarter of a mile long and varied from 10 to 200 feet in width—almost a solid mass, fully a fathom to two fathoms in depth."

One sure sign that fish are in the vicinity is the busy swooping of birds. Fishermen always are on the lookout for these harbingers. But McKusick learned that, with use of a plane, many schools of bait could be found even before the birds arrived. One morning, the *Liberator's* nets were already out, gathering precious bait which the plane had located, when the first birds came over looking for food. Without the plane, the fishermen would have been waiting for those birds to lead the way to bait.

Just as the presence of birds indicates proximity of bait fish, so do porpoises provide a clue as to where the tuna itself may be found. Porpoise apparently find tuna helpful in bringing up food. At any rate, they are companion fish. Locate birds and porpoise and chances are you're right on the tuna trail.

The practiced eye of a fisherman will tell him, depending on the species of porpoise, just how voracious the accompanying tuna is likely to be.

Spotting tuna schools by the porpoise-hunting method proved a far simpler business by air than from the ship.

"On a clear day," McKusick points out, "we could see the porpoise breaking water at a considerable distance. We could fly there, come down low and examine both the porpoise and the tuna school—the direction in which it was headed, and its magnitude. Given this valuable information, the *Liberator* wasted little fuel or time getting to the right place."

Soares and McKusick admit that spotting fish by air is a technique they have only begun to master. "We learned a lot on our first trip, but there is plenty more to learn," McKusick commented. "It may take several more trips to achieve full efficiency in scouting operations, but we had enough experience on the first voyage to assure ourselves that use of an airplane as tunaboat equipment is practical."

Several factors must be taken into consideration by the fisherman who contemplates use of a plane. The size of his ship, for instance, will limit the size and weight of his plane. The *Silvaire's* 1,260 pounds were easily accommodated on the 115-foot *Liberator,* which has a load capacity of 215 tons. But just how this weight was to be placed in relation to the vessel's center of gravity, a factor directly affecting the ship's operation on high seas, had to be determined.

Radio communications between boat and plane are essential, if one is to get fullest advantage from information which the plane can supply.

Safe and efficient methods of handling the plane at sea must be worked out. Before the end of the *Liberator's* first trip, its crew had become so adept at manipulating the plane that it was able to stop the vessel, take the plane aboard, and be under way again in 12 minutes.

Lowering and recovering a small plane on high seas might well be classed as one of the major problems. The *Silvaire* was lifted by use of a hoisting boom and a bridle secured forward on an engine mount fitting and to a sling passed around the fuselage. Coast Guard airmen have expressed amazement at the number of times the plane was thus handled without major damage.

Designed primarily for inland waterways, the 65-h.p. craft did a commendable job in the open ocean, according to McKusick. Of course, minor troubles were encountered. Certain modifications are being made in an effort to develop a fully efficient "tuna spotter."

McKusick proved an ideal shipmate for the experiment. A graduate of the Naval Academy (class of 1935) and of Pensacola the following year, he was as much "at home" aboard ship as in the plane. He performed all the duties of an ordinary fisherman—standing regular watches, helping the "chummer" excite the tuna with bait, setting nets, navigating, and wiping dishes, an "all hands" activity on the *Liberator.* All this, combined with his 45 hours in the air on flights ranging from 15 minutes to 3½ hours, kept him a pretty busy man.

On the high seas, visual contact was maintained at all times with the *Liberator,* regardless of length of time in the air. Use of the plane was restricted to cover only those areas into which the boat could move before nightfall. This comprised a safety measure against the event of a forced landing. It also meant that if likely-looking schools were located, they could be reached before dark.

Since return of the *Liberator,* other

tuna skippers have become seaplane and floatplane conscious. Some, even, have considered the helicopter and the blimp—recalling that Navy blimps during World War II often informed Pacific Coast fishermen of schools their crews had spotted while hovering offshore in anti-submarine patrols.

Just how extensive fishing by plane will become is problematical. But, you may be sure that the cruise of the *Liberator* with its "airborne eyes" has caused a lot of speculation among seamen of the tuna fleet. END

## San Diego County

(*Continued from page* 28)

could be spent at San Diego. Your plane could be hangared or tied down there, and flown to other districts in the vicinity as desired.

San Diego is California's oldest city. California was discovered at San Diego September 28, 1542, by Juan Rodriquez Cabrillo. The first of the California Spanish Missions, Mission San Diego de Alcala, was dedicated there in 1769 and the city still retains the charm and traditions of these early Spaniards.

It is a sightseers' mecca—everything from the first mission, Ramona's marriage place, Ballast Point, where Cabrillo landed, to Cobblestone Jail ruins, built in the first days of San Diego at a cost of $7,000 and whose one and only prisoner cut his way out in a matter of a few hours, appearing the next day at a popular bar. A modern-day sight is 400 fighting ships of the U. S. Navy riding at anchor in one of the world's 10 greatest harbors.

San Diego is on the edge of the warm semi-tropical waters of the Pacific, making deep sea fishing one of its chief attractions. Marlin fishing is big-time sport and charter trips are made up daily. Open party boats are plentiful for persons wishing to fish for yellowtail, tuna, barracuda, bass, broadbill and other deep sea species. June, July, August and September are excellent fishing months and additional information may be obtained through the San Diego Chamber of Commerce, the San Diego-California Club and commercial sport fishing companies. Outside of the charter trips for marlin, no reservations are needed for these trips. Average price for scheduled daily trips is $5, while cost per person for marlin charter trips is approximately $25 per person.

Meanwhile there is also surf, bay and pier fishing around the city, where corvina, croaker, perch, smelts, mackerel, yellowfish, bass and halibut may be caught. Fishing licenses are good for both fresh and salt water and cost resident citizens $2 and non-resident citizens $3 each, with no charge for persons under 18. Licenses may be obtained at all sporting goods stores, at piers, and elsewhere.

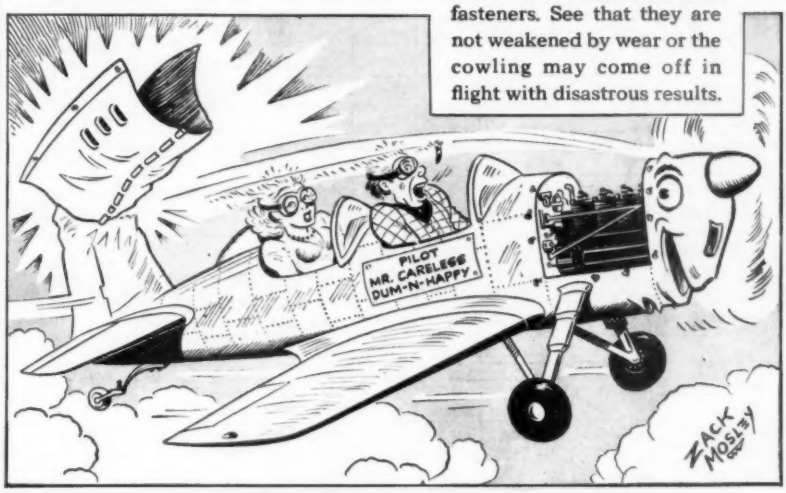
Detailed information on the best ocean fishing months follows:

SURFACE FISH. Yellowfin and bluefin


*Things to watch*

**IN MAINTAINING A PLANE**

Check the engine cowling fasteners. See that they are not weakened by wear or the cowling may come off in flight with disastrous results.




*Things to watch*

**IN CHOOSING SUN GLASSES**

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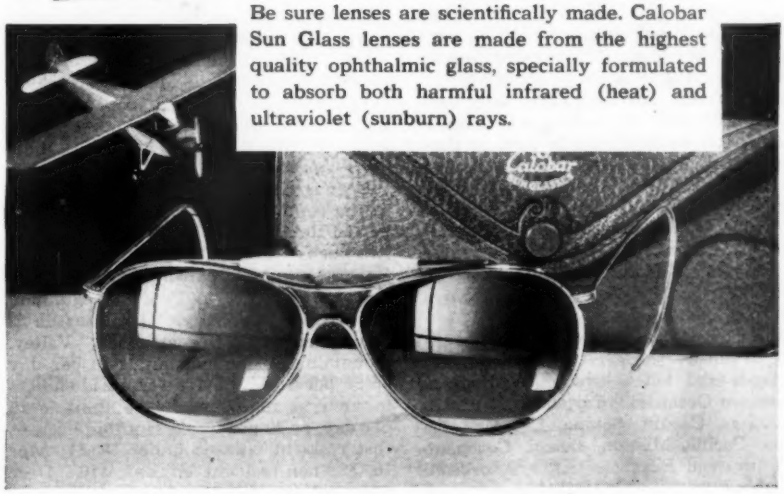

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## SOME AIRPORTS SERVING SAN DIEGO COUNTY, CALIF.

| Airport (longitude and latitude) | Phone number | Nearest town and distance | Number of runways | Length of longest runway | Gasoline grades | Service facilities | Season open | Write to |
|---|---|---|---|---|---|---|---|---|
| Lindbergh Field (32°44′ N—117°11′ W) | Main 0106 | San Diego (1 mile from downtown) | two | 8750′ Float plane Strip | 80-91-100 | A&E Mechs. All overhaul | all-year | Gordon McKenney, San Diego Harbor Dept. |
| Gibbs Airport (32°49′ N-117°8½′ W) | Woodlawn 7-0310 | San Diego (6 mi. north) | four | 3100′ | 80-91 | A&E Mechs. All overhaul | all-year | Bill Gibbs, c/o Gibbs Airport, Linda Vista Station, San Diego |
| Peik's Airport (32°48′ N—117°13′ W) | Jackson 9011 | San Diego (4½ mi.) | one | 2800′ | 80-91 | A&E Mechs. All overhaul | all-year | L. J. Cooper, 4850 Anna St., San Diego |
| Del Mar Airport (32°55′ N—117°15′ W) | Del Mar 400 | Del Mar (1 mi.) | one | 2640′ | 80-91 | A&E Mechs. All overhaul | all-year | H. C. Tolford, Del Mar, Calif. |
| Hi Hi Sky Ranch (33°11½′ N—117°21½′ W) | Oceanside 3003 | Oceanside (1 mi. east) | one | 2400′ | 80-91 | A&E Mechs. All overhaul | all-year | Kenneth Hill, Hi Hi Sky Ranch, Oceanside, Calif. |
| Warner Hot Springs Airport (116°37′N—117°15′W) | Warner Springs (Phone operator) | Warner Hot Springs Guest Ranch (2½ mi.) | one | 3500′ | 80 | None | all-year | Syo Furze, Warner Hot Springs, Calif. |
| National City Airport (32°45′ N—117°10′ W) | Greely 75543 | National City (1 mi.) | two | 2600′ | 80-91 | A&E Mechs. All overhaul | all-year | Harold E. Hawn, 3300National Ave., National City, Cal. |
| La Presa Airport (32°43′ N—117°0′ W) | Homeland 6-8782 | La Mesa (8 mi.) | two | 2000′ | 80-91 | A&E Mechs. All overhaul | all-year | E. E. Epler, Box 277, La Mesa, Calif. |
| Engel Airport (33°8′ N—117°12′ W) | Escondido 747 | Escondido (2½ mi.) | one | 2550′ | 80 | A&E Mechs. All overhaul | all-year | John Engel, Santa Fe Avenue, Escondido, Calif. |

tuna, August and September; yellowtail, May, June, July; barracuda, May and June; dolphin, July and August; Marlin, August and September; broadbill, August and September.

BOTTOM FISH. Bonito, May through August; kelp bass and rock bass, year-round; white sea bass, May and June; ling cod, rock cod, grouper, halibut, jewfish and sheepshead, year-round; mackerel, July, August and September.

SURF FISH. Corvina, June, July and August; croaker, June, July and August.

All fresh water fishing is done at Barrett, Cuyamaca, Henshaw, Hodges, Lower Otay, Morena and Wohlford Lakes, the farthest of which is only about 30 miles from the city. May through October is the best season and tackle may be rented at the lakes. Fishing permits cost 50 cents per day and boats may be rented for $1.50 per day.

San Diego County beaches are an allure to sun-worshippers and bathers, with cottages and hotels available. Popular areas are Oceanside, Carlsbad, Leucadia, Encinitas, Cardiff, Solana, Del Mar, La Jolla, Pacific, Mission, Ocean, Coronado and Imperial Beaches. All are serviced by public transportation and their use is free.

Off-shore at most of these beaches is aquaplaning, boating, yachting or surf fishing. There also is horseback riding, golf, picnic areas, sports and dining and dancing. Complete descriptions of each place, hotels and beach cottages available; their prices, and all other information the flying vacationist would need know can be obtained through the San Diego-California Club.

San Diego city hotels will range in price from $4 per day for a double room, European plan, to $29.50 per day double on the American plan. Beach cottages rent from $5 a day on up, depending on accommodations which vacationists desire.

Mountain resorts charge about the same rates as city hotels, with the guest able to select accommodations according to his means. Some are operated on the American plan, with meal prices included, and the others are on the European plan. Most have separate cottages, with some even set up for housekeeping if the guests wish to remain that long.

Only a few of the mountain resorts are directly accessible to an airport. However, most are not too far distant and the resorts will supply transportation from airfields if notified of arrival time in advance.

Deer is virtually the only game hunted in the county and the season is September 16 through October 15. The limit is two bucks—no does, fawns or spike buck. Rabbit season is always open. Duck season is subject to Federal regulation and changes annually. Quail season is November 15 to December 31. Valley, mountain and desert limit is 10 per day or 20 per week. Dove season is subject to Federal regulation. The limit is 15 per day, or 30 per week. Hunting licenses cost resident citizens under 18, $1; over 18, $2; non-resident citizens, $10. Deer tags cost two for $1. Licenses and tags may be obtained at all sporting goods stores and at mountain resort areas.

Airports serving the immediate San Diego city area are the following:

LINDBERGH FIELD, a Class V airport, is only five minutes surface travel from the center of San Diego. It is available to private planes equipped with two-way radio. Altitude is 15 feet above sea level. One concrete runway measures 8,750 feet and another measures 4,700 feet. There is one nearby seaplane strip. Radio, light gun and telephone communications are available. The airport is not marked but may be distinguished from many thousand feet. Two hangars and tie-down accommodations are available, as are all types of overhaul and all grades of fuel.

GIBBS AIRPORT, a Class II field, is located on Kearney Mesa, north of Mission Valley, in the San Diego district. There are beach facilities, cottages and hotels near-by, with surf and pier fishing. Altitude is 410 feet. One dirt major runway is 3,200 feet in length, and two dirt runways both measure 2,900 feet, oriented N-S and NE-SW. Telephone communications, major overhaul and weather reports are available. Four hangars are in service. Operators will supply transportation to San Diego, only eight miles away.

SAN DIEGO AIRPORT, a Class I field, is located on the south end of Mission Bay, San Diego, just north of Midway Drive. Altitude is 11 feet. One hangar is available for minor repair work and there is tie-down space for 75 planes. A line crew is on duty nine hours a day and weather reports may be obtained at a nearby pay telephone. Beach resort cabins are close by and surf and pier fishing are good. Transportation to San Diego, only six miles away, is by public bus, taxi or private car.

PEIK'S AIRPORT is a Class II field located at the southeast end of Mission Bay. Altitude is 11 feet. There is one oiled major runway 2,600 feet long and oriented NW-SE. Obstruction is a CAA radio range station on the north. Three hangars and the services of two A. & E. mechanics are available for all types of overhaul work. Weather reports are by telephone. This airport, too, is located near the beach and is six miles away from the heart of San Diego.

BORDERLAND AIRPORT is a Class I airport located only two miles north of the Mexican Border and the town of Tiajuana, and one mile west of the town of San Ysidro. Flying vacationists are cautioned not to fly across the border, however, because there is a $60 Mexican "customs" fee. Pilots may land at Borderland Airport or others in the district and cross into Old Mexico with no charge other than public transportation fare. The field has one oiled runway 1,900 feet long, oriented NW-SE. Power lines are on the south and east sides. Telephones are available, as are major overhaul facilities, a line crew and weather reports. A public bus provides transportation to Chula Vista, eight miles away, and thence to San Diego.

WOLFE'S AIRPARK, a Class II field, is located one-half mile southeast of Otay Junction, three miles north of the Mexican border. It is close to Lower Otay Lake, a good fishing area, and public transportation is available. It is only 16 miles from San Diego. Altitude is 220 feet. A dirt runway of 3,000 feet is oriented E-W and another, oriented NE-SW, is nearing completion. There is one hangar and only minor overhaul is provided. Operators will supply transportation to Chula Vista, six miles distant.

Fields at resort areas farther north from San Diego include:

DEL MAR AIRPORT, a Class II field, is located one mile northeast of Del Mar, and is immediately adjacent to the race track owned by Bing Crosby. Del Mar serves the city of Del Mar, Rancho Santa

Fe, Solano Beach, Encinitas, La Jolla and San Diego. The race season opens at the turf club in August. Golf, fishing, hiking, surf swimming and pool bathing, riding and sun bathing all are offered in these nearby resort towns. Hotel and cottage rates are reasonable, ranging from $4 per day on the European plan, upward. Altitude of the field is 10 feet. There is a landing mat 1,000 feet in length with a dirt extension of 1,640 feet. Light gun and telephone communications are available, as are all service facilities. There are no hangars but tie-down space is ample. Transportation is by public means and also will be provided by H. C. Tolford, airport manager. Tolford will supply further flying holiday information.

ENGLE AIRPORT, located a mile southwest of Escondido, is a Class I field. Hotel accommodations are available at Escondido. Lake Wohlford, a good fishing area, is only five miles distant. Complete information can be obtained through the Escondido Chamber of Commerce. The field has a dirt runway 1,920 feet. There are five hangars for storage and major and minor overhaul is offered. Transportation is provided visitors into the city.

HI HI SKY RANCH, located a mile and a half southeast of Oceanside, is a Class I airport. Altitude is 50 feet. The turf runway is 2,200 feet, oriented SE-NW. The port is marked and has two hangars. Major and minor overhaul is available. At Oceanside there is boating, riding, beach bathing, deep sea, pier and surf fishing, Mission San Luis Rey and other sightseeing tours. Hotels range from $3 to $10 per day, and cabins from $3 to $5 a day. Kenneth Nill, airport manager, and the Oceanside Chamber of Commerce will supply further information.

OCEANSIDE MUNICIPAL AIRPORT is a Class II airport located a mile east of Oceanside. Operator is William H. Farien, Box 218, Oceanside. The dirt runway is 2,500 feet long. There is one hangar and minor overhaul is handled. Transportation is provided into the city.

Here are some of the other airports in San Diego County:

WARNER HOT SPRINGS is a Class I field located only two and a half miles from the resort, Warner Hot Springs. The grass runway is 3,500 feet long, but no servicing outside of fuel supplying is available. Warner Hot Springs is close to Lake Henshaw, best fishing area in the county. There is pool bathing, hot sulphur baths, hunting, riding, hiking (trips arranged to Mt. Palomar, site of the observatory where the 200-inch telescope is now being installed), tennis, badminton and sunbathing. Prices range from $4.50 per day upward. Syd Furze at Warner Hot Springs Guest Ranch will give further details.

JACUMBA AIRPORT is located just east of the resort area of Jacumba Hot Springs, Jacumba, situated near the Mexican border and near the Imperial County line. The Class I field has a turf runway of 3,000 feet. Minor repair work is available. The resort is located 20 miles from Lake Moreno and fishing parties are arranged. Hunting parties also are made up during deer season. Sulphur baths, pool swimming, hiking, sightseeing and sunbathing are also offered. Write to the resort for further details.

NATIONAL CITY AIRPORT, a Class I field, is located on Highway 101 between National City and Chula Vista. One dirt runway 2,200 feet long is oriented NW-SE, and another, 1,500 feet in length, is oriented NE-SW. Two hangars are for storage and major and minor overhaul. A public bus and owner-operated cars supply transportation to National City. The field is close to the Mexican Border and also to Lower Otay and Sweetwater Lakes. There is fishing in San Diego Bay, only a short distance away. National City Chamber of Commerce will supply information regarding hotel prices and transportation to those who request it.

LA PRESSA AIRPORT is located only a mile north of the west end of Sweetwater Reservoir. One dirt runway measures 1,700 feet, oriented N-S, and another of 2,250 feet is oriented NE-SW. The field is marked. One large hangar handles major and minor overhaul, while 25 individual hangars are now being completed. All grades of fuel are available. Operators will supply transportation to National City, six miles away.

Additional airports, open all year, in the county include:

LA MESA AIRPORT, a Class I field located one mile west of La Mesa. Operator is C. C. Adams, Box 285, La Mesa. RAMONA AIRPORT, a class I field, located two miles west of Ramona. Contact is the San Diego County Airport Commission, San Diego. HAWN FIELD, a Class I airport,

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owned and operated by James and Harold Hawn, Box 326, National City. SWEETWATER SPRINGS AIRANCH, a Class I field located on Jamacha Road midway between Highway 94 and Sweetwater Lake, one and a half miles north of the east end of Sweetwater Reservoir. Operator is the T & A Flying Service, La Mesa. SAN MARCOS VALLEY AIRPORT, located one mile west of San Marcos. A Class I field operated by Lee A. Garner, Box 51, San Marcos. MCCORMICK FIELD, a Class I airport located a mile and a half west of San Marcos, owned by George Almand, Box 82, San Marcos. GILLESPIE FIELD, recently released by the military, is a Class IV airport located three-quarters of a mile southwest of Santee, Calif. The San Diego County Airport Commission, San Diego, will supply added information. EL CAJON AIRPORT, a Class I field operated by T. B. Smiley, Box 127, Lakeside, Calif., and located one and three-eighths miles north of El Cajon.

These airports and their proximity to vacation and resort areas are fully described in literature available through the San Diego-California Club, and the San Diego Chamber of Commerce, San Diego.

END

## Jets at Sea

(*Continued from page 47*)

rier decks with the comparable ease and efficiency of a piston-engine-powered plane.

Since the release of the *Phantom*, the Navy has announced a half-dozen new jet models, including a supersonic experimental vehicle, an attack plane and a jet patrol plane. In addition to these, there are many more jet configurations in early engineering stages at various factories throughout the country. These models will be joining the Navy in the near future.

Major jet-development difficulty is that of getting a plane on and off a small mobile landing area under combat conditions. At low speeds the propellered plane has a definite acceleration advantage over most jet airplanes. This lack of power at low speeds detrimentally affects jet plane take-off and wave-off characteristics.

The *Phantom* experienced no difficulty in taking off the carrier *Franklin Delano Roosevelt* during its initial tests. Its take-off run is no longer than that of some conventional fighters now in use. The P-80, with minor modification, was able to complete its carrier trials successfully. This is concrete evidence that in the not-too-distant future slow acceleration will no longer be a jet-plane problem. For the present, however, most jet planes must be catapulted when decks are small, and when the planes are carrying heavy loads.

The catapult still is considered the best answer to the slow acceleration problem of either jet-powered or conventional aircraft and has been used for many years aboard various types of ships. It is being continuously improved and modified to make it capable of launching heavier aircraft and to give the faster end-speeds required in jet planes.

But take-off is only part of the problem. Higher landing speed, longer landing run and greater floating tendencies of the jet plane—plus its dependence on velocity for power—gives rise to new tactical problems.

To get aboard flat tops properly, jet pilots may have to be given the "cut" signal sooner. Wave-offs may be given sooner to insure adequate altitude by the time the plane reaches the ship. The clean design of jet airplanes, and residual thrust of the engine after cutting the throttle, may make a quick-acting drag device desirable in order to keep the airplane from floating excessively. This device will probably take the form of a drag flap, either on the wing or on the fuselage, that will be actuated on the "cut" signal.

Actual jet aircraft operation off carriers in recent tests have shown that many anticipated difficulties were overestimated. At the same time, many unforeseen though minor problems have arisen.

The jet engine requires a new starting technique. Because of the numerous advantages of the internal electric starter it has become preferred over all other starting systems. The jet turbine, however, requires several times the power for starting, uses electric controls and has more electronic equipment than the conventional airplane. The excessive battery weight required precludes the use of internal power units. Therefore, some type of external power supply is needed —a battery cart with enough power units to turn the turbine up to required starting speed for starting, or a generator that can develop the high power desired.

Research is continuing, however, in the development of an internal power unit capable of delivering the power necessary for the needs of the jet engine without too great a sacrifice in weight.

The change from propeller to a jet has called for a new definition of deck safety. Although the jet blast is a danger somewhat comparable to the propeller, the relative danger is far less. In the past a propeller injury was either fatal or dismembering. The jet blast should never be fatal for many reasons. First, the blast is only dangerous in a small area immediately behind the jet. Second, a person walking into the jet is warned by the heat long before he gets into the danger zone; he need move only a few feet to clear himself. Third, during carrier operations personnel normally wear enough clothing to protect themselves from wind and flashburn; these clothes need only be fire-resistant to be sufficient protection from the blast. Fourth, a man walking inadvertently into the blast would normally be blown to safety by the force of the jet itself before being badly burned. Last, to achieve economy of operation, the jet engine probably will only be started and run in small specified areas, just prior to take-off, thereby cutting down the opportunity for accident tremendously;

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and, since jets require no warm-up, starting immediately prior to take-off should not slow operations.

The jet exhaust will modify our handling technique of the arrested airplane after landing. In some designs it will be impossible for the hookman on deck to clear the arresting wire from the hook due to the blast. The plane may, however, drift back enough on deck to allow the wire to fall free of its own accord. If future operation proves the plane cannot be relied upon to release itself in this manner, an automatic releasing mechanism will be used. This mechanism may be fully automatic, actuated by the pilot, or actuated by the hookman mechanically from some point on the plane away from the jet blast. All methods are being studied at present.

The jet exhaust is not hot enough to have a dangerous effect on another plane parked immediately behind it. However, the fumes and gases emitted by the blast are so nauseating that they may restrict a manned aircraft parking nearer than 50 feet or so. And even though the plane is only turned up immediately prior to take-off this would necessitate a widely staggered dispersal of aircraft on deck if planes were taking off without catapult. When catapulting, the planes probably won't use their engines to taxi up to take-off position but either will have to be towed up or automatically conveyed to the spot position by a mechanical conveyor or dolly. However, the use of the jet engine during deck handling operations will have to receive extensive test and analysis before a definite policy can be established.

Jets use an excessive amount of fuel at idling speeds. This feature in itself will prevent deck taxiing to a great extent. However, there may be times when movement of jet planes on deck under their own power is necessary. Therefore, various methods are being studied to eliminate some of the negative aspects of the jet blast in deck handling.

One system would elevate the jet blast over the heads of deck handlers and plane personnel. This would employ a jointed nose wheel which can be broken into an elbow after the plane has been removed from the arresting gear and will allow the plane's nose to drop to a kneeling position. This would raise the tail and enable the plane to use its jet for taxiing without endangering personnel with the blast. Another method being considered is a deflector on the jet nozzle. This system would deflect the jet upward and also tend to hasten dissipation of the blast. This deflector also would aid in cutting down the effect of the residual thrust after the throttle has been closed on landing and might be actuated in unison with the thrust spoiler in the groove.

Another problem that will require some solution comes from the widely adopted use of tricycle landing gear for jet planes. In the past some propellered carrier planes had tricycle gear but none have been extensively used aboard ship. Adequate gear has already been developed for handling conventional tail wheel aircraft. It is necessary now to modify or revise this equipment to meet the needs of the tricycled jet plane.

The major problem of the jet configuration has to do with the carrier barrier. Barriers, heretofore, have been so constructed that planes missing the arresting wires crashed head-on into the barrier wires. The pilot was amply protected because he sat well behind the engine, which absorbed the initial shock. But the jet plane has moved the pilot into a vulnerable position. This means that the barrier must be redesigned to stop the plane without endangering the pilot.

The *Phantom* had an arresting arm rigged just in front of the pilot's cockpit, sticking up and forward at a 45° angle. Somewhat the same type of arm was used on the *Shooting Star* during its trials. This type of barrier arrestor is being studied but isn't considered to be the final solution.

Since tricycle and tail-wheel airplanes will be operating together, the new barrier must be suitable for both types of aircraft. The immediate answer seems to be in a barrier that will act directly upon the main landing gear of tricycle planes rather than on the engine. But it must have flexibility enough to be quickly shifted to act upon the engine of a conventional plane.

A specific barrier has been developed for jet airplanes, but it has to be modified in proportion for each different type jet plane that is to use it; only the principle of operation remains the same.

Because of the large quantity of fuel burned by jet, a method of faster fueling is required. The speed with which a plane can be re-armed and re-fueled is one of the controlling factors in the matter of how many planes a carrier can send on a strike. Some present equipment can and will be modified to meet the higher flow necessary.

It is possible that soon the fueling apparatus may be moved from the top to under side of the airplane. With the new system, the supply of fuel can be shut off automatically without spillage, minimizing fire hazards materially and speeding refueling under adverse conditions of weather, wind and darkness. In addition, the same system could be used for both fueling and de-fueling, thereby making the equipment and the airplane attachments simpler and lighter.

New re-arming techniques and mechanisms will have to be developed and old ones modified in order to re-arm a jet plane rapidly because it sits considerably lower to the deck than a conventional plane.

The limited endurance of jet planes demands a more expeditious means of plane recovery aboard carriers. Since the landing and take-off interval will be faster, more efficient methods of deck handling will have to be evolved. One means of stepping up the handling will be the use of faster tractors and conveying gear.

Some changes may be made in the launching equipment of the catapult. Possibly a new type of retractable hook will replace or augment the present bridle holdback. Heavier loads will be launched at higher end-speeds.

Naturally, we will have to alter our

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present conception of aircraft maintenance somewhat to fit the requirements of the new jet airplane. Fundamentally, maintenance of jet turbines and maintenance of piston engines differ radically. Piston engines require periodic checks, constant minor repair and small part replacement. However, the piston engine will run for several hundred hours before complete overhaul or engine change is necessary.

The jet turbine is a much simpler power unit and is not complicated by a great number of critical small parts that require continual replacement or repair between overhaul. However, the life of the jet engine is considerably shorter than that of the piston engine. Complete overhaul or engine change is required after a comparatively short running time.

In the past, carriers operating with reciprocating engines carried large quantities of spare parts but very few engine replacements. No engine overhaul facilities were necessary. If the present service life of jet turbines is not lengthened, carriers maintaining them either will have to equip and maintain an overhaul shop aboard or carry a large number of packaged replacement engines. Research and development are constantly lengthening the life of the turbine. By the time active carrier squadrons of jet planes are in operation, overhaul facility or engine replacements may not be required.

As for the future training of Naval Aviators in jet airplanes it will be some time before an active program is inaugurated because of the limited number of jet aircraft available. At the present pilots are being "hand-taught" by test units. But plans now are being formulated to incorporate jet training into the basic flight training syllabus. Cadets probably will go through regular stages of training up to and through propeller-powered fighters, then have a short dual jet training phase. A two-place jet trainer is even now being studied by the Navy.

After primary jet instruction the student will go into the operating jet fighter and qualify before going on to fleet units for further carrier and advance combat training.

These then are the general problems confronting the active operation of jet airplanes in the fleet. Although handling changes are manifold and in some cases radical, basic concepts of handling aircraft aboard ship hold good for either jet aircraft or conventional planes.

Operation of jet aircraft aboard a carrier is just another step in the overall evolution of Naval aviation, as is the conversion from piston engines to jet turbines a part of the general evolution of aviation itself. END

# DO YOU KNOW..?

TEST your aviation I.Q. with this quiz by G. Sidney Stanton of the Civil Aeronautics Administration. Here's how to score yourself: 100 per cent and you're an airline pilot; 90 per cent and you're a flight instructor; 80 per cent, commercial pilot; 70 per cent, private pilot; 60 per cent, student pilot; 50 per cent or less, you're a Dilbert.

1. A pilot on an instrument flight knows he is "on the beam" when he hears in his earphones (1) a series of dots; (2) a series of dashes; (3) a steady hum; (4) the code letter of his radio range station?

2. At night a pilot needs "night vision." The amount of time required for eyes to adapt themselves to reach the peak of night vision is (1) five minutes; (2) 10 minutes; (3) 30 minutes; (4) 60 minutes?

3. When a pilot uses the word "Mayday" over the radio, he means (1) my radio reception is poor; (2) I am in distress; (3) all is well; (4) weather is clear?

4. A round-trip flight to an airport 100 miles distant could be made in the least time if there were: (1) a headwind outbound and a tailwind back; (2) a tailwind outbound and a headwind back; (3) a 90° crosswind both ways; (4) no wind?

5. The caps of fuel tanks are provided with vent holes mainly to (1) prevent dangerous pressures from developing in the fuel tank if there is a rise in temperature; (2) permit the fuel to spill out if the tank is filled to full; (3) enable the pilot to check the amount of fuel visibly or to insert a measuring rod; (4) facilitate the flow of fuel to the carburetor?

6. A 100-h.p. airplane engine burns approximately eight gallons of gasoline per hour and its plane carries about 40 gallons for a five-hour flight. If the airplane had to carry the air which supports combustion in the cylinders, the air tanks for a five-hour flight would require a capacity of (1) 16,000 gallons; (2) 40,000 gallons; (3) 100,000 gallons; (4) 320,000 gallons?

7. Lightplanes have a ceiling generally ranging from 10,000 to 15,000 feet. The chief reason they cannot fly higher is (1) the air is so thin it won't support the plane; (2) the amount of air passing through the carburetor is insufficient to supply enough power; (3) the force of gravity gets progressively stronger; (4) the air at altitude is so cold that it doesn't mix well with the fuel and combustion is inefficient?

8. A certain airplane flying at 100 m.p.h. can sustain a weight of 3,000 pounds. If its speed is increased to 200 m.p.h. it will be able to sustain (1) 3,000 pounds; (2) 6,000 pounds; (3) 9,000 pounds; (4) 12,000 pounds?

9. All airplane engines are provided with (1) two magnetos, (2) two carburetors; (3) two fuel tanks; (4) two flywheels?

10. When a lightplane is in level flight, the lifting force on each square inch of wing area is (1) less than an ounce; (2) about one pound; (3) about three pounds; (4) more than eight pounds?

*ANSWERS ON PAGE 92*

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## Grand Traverse Bay

*(Continued from page 31)*

County. Traverse City airport is near the city of the same name near the south shore of the bay and just about in the geographical center of the region.

All except Woolsey Memorial, which is not open in the spring, are year-round ports. All have at least two runways. At least 80 octane gasoline is available at all of the ports. The largest airport is at Traverse City and is equipped for airline-type operations and has four bituminous runways, the longest of which is 5,200 feet.

Boating, camping, fishing, hiking, hunting, riding, sightseeing, swimming are common sports; in winter there are iceboating, skating, skiing, tobogganing. The annual summer championship of the National Shuffleboard Association will be held in Traverse City July 21 to 23. The Michigan association tournament will be held there July 14 to 16.

If you visit Traverse City before the Fourth of July you will find that 60 per cent of the city's men are wearing beards in honor of the centennial celebration. They have been growing their whiskers since January and the mutton chops, handlebars and burnsides will be judged in a mammoth whisker derby on July 3. Prizes will be given for the longest, neatest, most unusual and best textured beards.

The five counties of the Grand Traverse Bay region are Antrim, Benzie, Grand Traverse, Kalkaska and Leelanau. Antrim is the northernmost of the five, fronting on the west shore of Grand Traverse Bay. Westward, across the bay from Antrim, is the peninsula of Leelanau County, between the bay and Lake Michigan. South of these two counties, which are separated by the great arm of Grand Traverse Bay, is a southern tier of three counties. From west to east they are Benzie, Grand Traverse and Kalkaska.

This country is mostly logged over. There are a few stands of virgin white pines and hardwood left in small plots but the cutover land is growing up again rapidly. It is a great orchardland. In spring the cherries turn the hillsides white, and a little later the pinkish apple blossoms come along.

The white sand beaches along Lake Michigan stretch unbroken for miles. Back of them there are often rugged hills with commanding scenic vistas. Fishing is excellent. Panfish, large- and smallmouth black bass, muskellunge, walleye pike, brook, brown rainbow, steelhead, and the mighty lake trout are all caught.

In fall, resorts in the five counties are open for deer hunting and ruffed grouse shooting. The region is a growing winter sports area, with skiing, tobogganing, iceboating and other winter sports increasing in popularity.

ANTRIM COUNTY, named after a county in Ireland, borders the west shore of Grand Traverse Bay. Just a few miles inshore and paralleling the shoreline is Michigan's largest lake, beautiful Torch Lake. The longest chain of lakes in the

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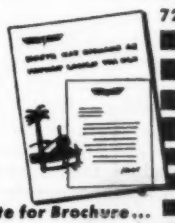

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lower peninsula lies in Antrim County and canoes and boats can be rented. On one 65-mile trip there are only two easy portages. Deer, ducks, grouse, rabbits and wildcats are the principal game. Excellent trout streams lie within the county and lake trout out of Torch Lake often weigh over 20 pounds.

KALKASKA COUNTY is directly south of Antrim and the only county without a shoreline on the bay or on Lake Michigan. There are a number of lakes in the county, however, and it is one of the best fishing and deer hunting regions in Michigan. There is excellent trout fishing in the Little Manistee River. Kalkaska County has a greater variety of wild flowers than any other county in Michigan, and one bed of native orchids has been in existence for more than 80 years. Despite the inroads of the lumberman, Kalkaska County still has a vast acreage of hardwood forests.

GRAND TRAVERSE COUNTY east of Kalkaska along the southern shore of Grand Traverse Bay, is the heart of the five county vacation region. Traverse City, a community of 20,000 population, is the largest trading city in the region. Its four cherry packing and freezing plants, and the vast cherry orchards nearby help it to claim the title of "Cherry Center of the World." The National Cherry Festival is held there. Sometimes whole families come north during July and August to combine a vacation with the cherry harvest. The National Music Camp at Interlochen is situated in a virgin pine forest between two lakes 14 miles south of Traverse City. Here young musicians come from every state in the country to study for 10 weeks each summer. The summer national shuffleboard tournament is also held in Traverse City. In this shuffleboard center of the country, the courts are located on shores of the bay only five minutes walk from the heart of the city. There is even a club house with full facilities. Winter sports are well established, with ice fishing adding to their attraction. Trout streams cross the county and the Boardman River contains Michigan's largest brown trout. The northern tip of the Old Michigan Peninsula rests on the 45th parallel and is exactly halfway between the equator and the north pole.

BENZIE COUNTY lies between Grand Traverse County and Lake Michigan. Benzie County has high hills, lakes and fast streams. A commercial fishing fleet out of Frankfort adds color to the scenery and 25 miles of beach front on Lake Michigan. The Platte River has record-breaking rainbow trout. Beulah, a resort village on the shores of Crystal Lake, was scene of Michigan's first big smelt run, which is now developing again after the recent smelt famine. Frankfort is the metropolis of Benzie County. It is located high on a bluff overlooking the lake and has tourist accommodations and an active lake shipping business. Thousands of persons fish from the breakwater pier at Frankfort for the big yellow Lake Michigan perch. Orchards and farms lie in the back country. The muck land grows huge fields of celery and onions. Lake Ann has the best wild goose hunting in Michigan and there is deer and grouse hunting in the country. The Betsey River was once one of the important logging streams, and the lumbermen drove big rafts down the Betsey to the Frankfort Mills. Many of the songs of the "white water boys" which still survive are based on running the Betsey. Along the roads in Benzie County are occasional cherry huts which serve turkey sandwiches, fresh hot cherry pie and other fresh fruit confections.

LEELANAU COUNTY is the peninsula between Grand Traverse Bay and Lake Michigan. Surrounded by water on three sides, Leelanau is one of the coolest summer areas in the north woods. Shouldering up to beautiful Glen Lake in western Leelanau County is the 400-foot high Sleeping Bear, the world's largest traveling sand dune. A "dunesmobile" has been developed for sight-seers which whirls up and down the steep slopes and across the sandy dunes. Fishing the big Mackinac trout centers around Northport and a fleet of chartered cabin cruisers works back and forth across the reefs in Grand Traverse Bay carrying visiting fishermen. Trout weighing up to 25 pounds are common and they have been caught weighing as much as 50. Many small streams in Leelanau County contain brook trout and its lakes yield bass, pike, muskies and pan fish. Leland, the county seat on Lake Michigan, is the home of a picturesque fishing fleet and has been the site of Michigan State College's summer art classes. Peshawbeton is the last Indian colony left in northwestern Michigan. Indians still carry on their baskets and beadwork and there is an old Indian church and burial ground. At Northport and Northport Point are magnificent summer homes. Leelanau County has ski and toboggan runs, ski

## THE FOUR AIRPORTS AROUND GRAND TRAVERSE BAY

| Airport (latitude and longitude) | Phone number | Nearest town and distance | Number of runways | Length of longest runway (ft.) | Gasoline grades | Service facilities | Season | Write to |
|---|---|---|---|---|---|---|---|---|
| Bellaire (44°59'-85°12') | 7 F1 | Bellaire (1mi NE) | 3 | 3,000 | 80-91 | hangar | all-year | Lew Ritt, Bellaire, Mich. |
| Frankfort (44°38'-86°12') | none | Frankfort (1.9mi. SE) | 2 | 2,900 | 73-80 | hangar | all-year | R. D. Griffin, George Bennett, Frankfort Mich. |
| Traverse City (44°44'-85°35') | 919 | Traverse City (2mi. SE) | 4 | 5,200 | 80-91 | major repairs | all-year | Traverse City Chamber of Commerce. |
| Woolsey Memorial (45°10'-85°35') | none | Northport (3mi. NE) | 2 | 2,100 | 80 | none | summer fall winter | Traverse City Chamber of Commerce. |

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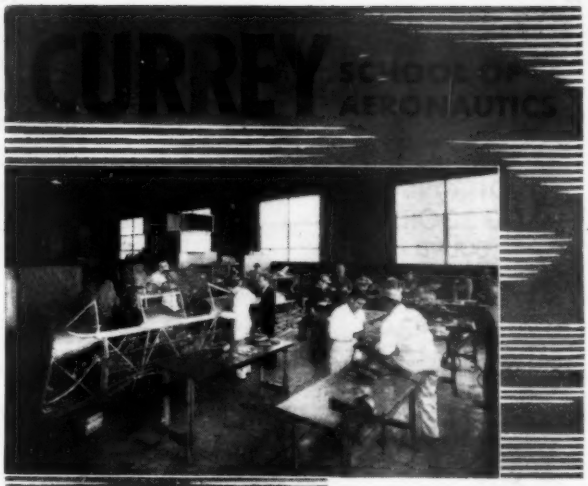

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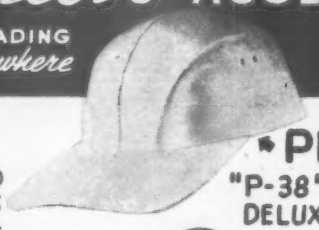

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jumps, and long ski trails and is being developed as a foremost winter sports center.

Vacationing in the five counties around Grand Traverse Bay offers a unique selection of summer sports.

*Boys' and girls' camps.* There are boys camps out of the postoffices at Central Lake, Kalkaska and Glen Arbor, and girls' camps out of Central Lake, Northport and Glen Arbor.

*Horseback riding.* All the counties but Kalkaska have riding stables where horses can be rented. Stables are located at Bellaire, Elk Rapids, Traverse City, Beulah, Frankfort, Glen Haven and Northport Point.

*Archery.* A fine roving archery course of 39 targets and golf is located on the shores of Crystal Lake in Benzie County. Many archers shoot in the dunes areas where they do not lose or break their arrows.

*Golf.* There are 11 public golf courses, including Bellaire, Elk Rapids, Frankfort (2), Glen Haven, Leland, Maple City, Northport Point (2), Traverse City (2).

*Tennis.* Public tennis courts are available in Bellaire (Richardi Park), Eastport, Elk Rapids, Beulah, Frankfort, Old Mission, Traverse City, Kalkaska, Northport, Northport Point and Suttons Bay.

*Boating.* Speedboat rides and cruises are available at Traverse City, Suttons Bay and Elk Rapids. Special cruises can be arranged.

*Fishing.* The most unusual sport, probably, is the deep sea trolling for Mackinac trout. Trolling camps are at Traverse City, Suttons Bay, Elk Rapids and Northport. Resident fishing licenses cost only $1. Non-resident licenses cost $2 and are required of every non-resident fisherman over 17 except a licensee's wife, who may obtain a similar license for 50 cents. A special 10-day non-resident license is available for $1. No license is required for catching perch, catfish, bullheads, blue pike, sand pike, ciscoes or carp by hook and line from Lake Michigan.

*Hunting.* Deer, rabbits, ducks and partridge are abundant in all the five counties. Bear are shot in Antrim, Benzie and Kalkaska Counties and squirrels in Kalkaska and Leelanau Counties. A resident small game license is $1, big game $2.25. Non-resident small game license is $5, non-resident big game license north of townline 16 is $15 and south of townline 16 is $25.

*Scenic drives.* Automobile tours can be planned to visit Indian villages, cherry orchards, fishing towns and sand dunes. Information can be obtained upon request from the Traverse City Chamber of Commerce.

Vacationing in the Grand Traverse Bay area can be made to fit your purse. Hotel rooms will range from $1.50 a day and up at Bellaire and $1.75 and up at Northport to $2 and up at Traverse City. Cabins will cost from $2.50 and up, and tourist rooms will cost $1 and up at Frankfort, Northport and Bellaire to $1.50 and up at Traverse City. Guides cost about $5 per day, though they are not always available. Chartered boats for fishing Mackinac trout cost $25 per day, including the guide. END

## I Learned About . . .

(*Continued from page 52*)

the dash, flying blind but knowing I was headed for bottom, I finally discovered what was wrong. It could have taken but a few seconds but it seemed like hours before I found that a plastic or hard-rubber handle atop the stick had somehow become unscrewed and had slipped up an inch or two. It was far enough up on the handle so that it caught under the dashboard when I tried to pull it back.

By now I knew I was well beyond the 160 red-line mark and going harder all the time. I must have been doing over 200. I kept my head down under the dash and screwed madly away at that grip handle. I could see nothing but that handle and I worked at it with all the intensity of a man fighting for his life. And I was.

I managed it, at last. I didn't waste a second. I just hauled back on the stick and pulled it clear back into my lap as hard as I could. Then I blacked out.

It is the only time in my life I ever blacked out in a plane, despite my 14 months in Army service and despite my years of active flying. It is almost indescribable—and it's terrifying. My mind remained clear but everything else went out. I could see nothing but blackness. It was as though an executioner had slipped the black velvet hood over my head, down to my shoulders. My limbs were sluggish, and it required terrific exertion to move them. I retained consciousness, though, and held that stick back in my lap with all the strength of mind and muscle I could muster. It was all I could think of—and it saved me.

Afterward, those who saw what was happening from the ground told me that I went into a screaming split-S and cleared the ground by less than 40 feet. But I didn't know about it at the time. I was blind. They told me later that I then climbed to a quick thousand and levelled off. Much of it must have been sheer instinct because I have no clear recollection of it. I recall, hazily, that I felt that I should level off and dimly remember moving the stick forward. The blackout lifted at last and I regained control of myself and the airplane, and realized I was safely in normal position, with everything functioning perfectly and the altimeter showing somewhere around a thousand.

I don't know to this day, nor do I ever want to, what speed that Waco was making when I went into the split-S and up again. I don't know how the wings stayed on, either.

When I stepped on ground again, I had learned about flying from that. I had learned that no matter how well you know what the books and the instructors tell you about what to check before taking off, you still don't know it all—not by plenty. Now I check everything the books and the pilots tell me—and then I really start checking on my own, everything I can think of. That stick-handle was not listed in any book. Nor are lots of other little things. But they're listed in my mind now, believe me. END


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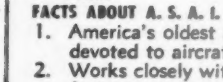

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# Flyers' Night School

*(Continued from page 27)*

much time for it during the day or on week-ends, soloed after 8 hr. 40 min. of night instruction. After that he took spins, stalls, acrobatics, everything called for in the private pilot's course—and all of it at night.

Mosier started his training last fall, and soloed the *Cub* at Christmas time. His instructor, C. E. "Butch" Burchinell, chief instructor for Ashburn, says he was never more sure of a safe solo during his teaching career.

Burchinell, who was a primary instructor for the Navy during the war, contends that "anyone who can learn to fly in the daytime can do it just as well at night, and we're willing to prove it on anyone who can pass a CAA physical." He even feels that night-time may be the best time to learn. There is less distraction, he points out, fewer planes in the traffic pattern than on week-ends when most students are getting their stick time.

"Mosier had little or no trouble," Burchinell reports. "He could have soloed with less time, but I gave him the benefit of the doubt because he banked a bit too steeply in his turns.

"This steep-bank tendency, by the way, is characteristic of most night students," Burchinell points out. "As for spins and stalls, Mosier had little or no difficulty. First, we got squared away on the horizon—that's easy to establish at night, particularly around a city as well lighted as Washington. [Hybla Valley is just across the Potomac.] There's a break between the lights of the city and the stars, where a patch of darkness makes for a good horizon just a little bit higher than the normal daytime horizon. So we flew with the nose a little lower on the horizon than in daylight flying."

Mosier's training got out into daylight only on his cross-country. The reason is obvious. Night cross-country flying requires use of beams, not the landmarks which are necessary to map reading on contact flights over unfamiliar terrain.

Ashburn considers it an excellent business venture. "We had nearly 300 hours flown at night during the first six months," he says. "And those were 300 hours that otherwise would have gone unflown. Also, we've talked some of our week-end customers into coming at night, thus giving us time for additional week-end students. And our night business grows more popular as we go along."

Ashburn now is using *Cubs* and 85-h.p. Luscombes for night training. He has equipped the planes with a light which hangs above the pilot's head on the left side of the cockpit. When in operation it casts a moon-glow effect on the panel. It can be controlled by either the instructor or student. Thus far, Ashburn reports, no cases of vertigo have developed during night training, a record which he attributes to the light set-up.

The installation of a comparatively new lighting system aided in the inauguration of the night-flying program. The American Gas Accumulator Company of Elizabeth, N. J., chose Hybla Valley as a laboratory for their "packaged" runway lighting system and set up 5,000 feet of runway lights on the main strip there. Receiving the lights free, Ashburn has co-operated in the various tests which have been made. Mosier's training was only one of the projects.

Business has proved so good and expenses so low that Ashburn has ordered AGA to deliver an additional 8,000 feet of the lighting system for use on two other runways. With the additional business this will attract, the Hybla Valley operator expects to pay off the investment—which costs a purchaser just less than a dollar a foot—within a short time.

The new runway lights are easy to install—the first 5,000 feet at Hybla Valley were installed by three men in only a few days.

With a one-horse plow, one can lay the neoprene-covered cable connecting the lights, which are placed 200 feet apart in keeping with CAA regulations.

The CAA says that the cable must be placed at least eight inches underground, but AGA advises that the depth be closer to a foot. Each light is raised above the ground by means of a spun aluminum cone based on the surface of the ground and topped by a plastic shade for the bulb. If a plane propeller should strike the plastic shade and knock out the light, only one light will be damaged. An individual transformer for each light prevents shorting out the entire system. Cost of replacing the plastic coverings is nominal. Upkeep on the system, according to Ashburn, is not expensive, varying according to the weather.

The eight-inch elevated position of the light and the aluminum cone afford protection against freezing conditions that standard lights now used by larger airports do not have. When lights at nearby Washington National Airport were obscured by ice because they were at ground level, Ashburn's burned brightly.

Each of the lights has a small insulating transformer just below the surface of the ground. These are connected to each other, as well as to the power supply and control unit, by plug-in cables. This control unit is the outstanding feature of the whole system. To connect the system to the power line, all the operator has to do is plug it in. A rheostat lever controls brightness so that, if the night is clear, lights can be run at low strength to save electricity. Three settings of 10, 30, and 100 per cent are available.

Also combined in the control unit are switches for obstruction lights or windtee lights, both of which may be fed from the one unit. If more than one runway is equipped with a lighting system, these switches may be used to direct power to light whichever runway may be desired.

Ashburn has his unit set up so that the control box is at one end of the hangar, close to the field's operations office. "We simply turn the lights on about sundown and fly through the sunset and early evening hours," he reports. "Part of an instruction period may be just before sunset and without the use of lights; part of it after sundown and with lights. There

is seldom a break in the flight schedule, although we arrange schedules to please the customers. Few fly past 10 p.m."

In the AGA "package" comes all the elements necessary for lighting a field. The company does not lay out the system. As one official says, "It's too simple for anyone to miss on it."

Here, then, is a formula for increasing a fixed-base operator's income—night flying. And here is one of the lighting systems which makes such a project practical. Bob Ashburn believes the combination he has worked out is completely safe. Already it has proved itself lucrative. He is making money and his students are saving time. END

## Report from Washington

(*Continued from page* 32)

off planes traveling at supersonic speeds. Radio and radar antennae were installed inside experimental models, but they picked up interference from the plane's metal skin. AAF engineers proposed a glass wing and glass fuselage. Tests show that the glass wing withstands 105 per cent of the required design load without buckling or wrinkling; glass fuselage tested 50 per cent stronger than metal. An all-glass plane will probably result, although its manufacturer is top secret.

### Noise Map

One of the most unusual maps ever designed is soon to be completed by the CAA, following tests by A. L. Morse's aircraft development division at Indianapolis. Instead of showing geographic highs and lows, the contour-type map will show peaks and valleys of sound around typical airport with respect to the port's traffic pattern and the kind of planes it has warming up, taking off, and landing. CAA hopes that the maps will measure, with reasonable accuracy, noise at any airport and can be used by operators in noise-nuisance suits.

### Two-Oh-Two

Paid a visit to the Glenn Martin plant in Baltimore a few days ago and flew around in one of their 2-0-2's (called that for reasons known only to them—and don't forget the hyphens). If orders are indicative, the plane is already a success, Harry Rowland, executive vice-president, pointed out. Tally at that time was 300 orders—and no cancellations—on the 2-0-2 and the 3-0-3, pressurized and supercharged version of the 2-0-2. That's enough to keep the Martin plant busy for four or five years. Martin emphasizes the load-factor efficiency of the plane—a DC-3 needs a 93 per cent load factor to tally a profit, a DC-4 needs 62 per cent, but the 2-0-2 needs only 47 per cent. And there is much talk of the plane's possibilities as a builder of freight business for the airlines. Martin has gone so far as to design special "preloaded containers" to speed cargo handling and to save shipper costs.

### Search Radio

The world's greatest radio detective network is standing by from here on in to help you if you get lost aloft. The network includes units that ran down secret Nazi stations during the war, usually in a matter of minutes. They are operated by the Federal Communications Commission, which has 10 primary direction-finding stations on a teletype hookup and seven others in a radio network. They can take bearings on any transmission between two and 20 megacycles, and already have had some emergency experience in helping lost aircraft. Networks operated by the Coast Guard and the Army are being tied into the FCC's, and CAA is hooked up by direct telephone communications.

The way to use the networks if you are lost is simple. If you need direction-finding assistance, notify any available CAA facility of the list of frequencies on which you can transmit. Direction-finding personnel is immediately alerted. Then you will be told which frequency to use for a "long call." Remember this: many direction-finding efforts have failed because pilots made their transmissions too short. To get a good fix, at least five minutes of steady radio transmission is necessary. And don't forget to repeat identification calls frequently. The fix should come through fast—if you keep transmitting for five minutes—with dope on a course to fly to the nearest good field. END


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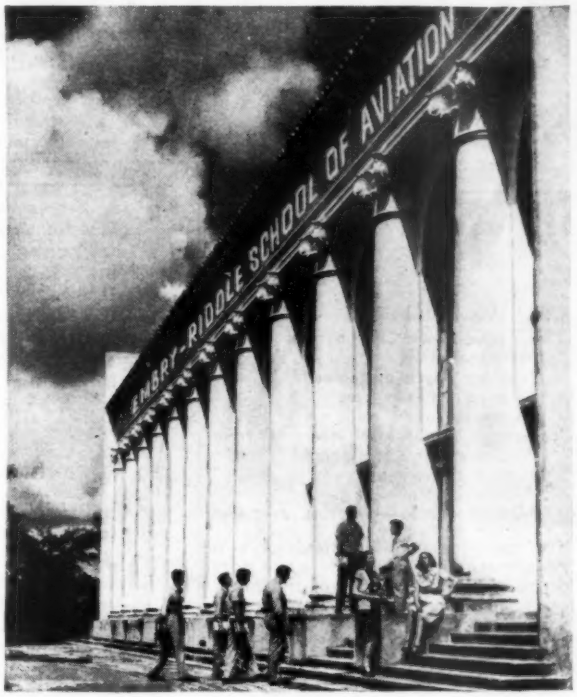


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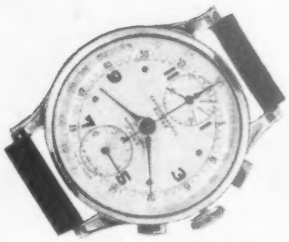

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# Letters

(*Continued from page* 6)

rich and lean mixture control would not work. I requested that this be repaired before taking off, but found that the first time I pulled it out it had not been repaired and it almost caused me to make an emergency landing. To top it all, I had to pay for all the gas and oil in the tanks.

So now the plane stands in the hangar waiting for warm weather and for a radio to be either repaired or replaced. There are airports we cannot get into without a radio. I am a businessman, not a kid looking for excitement. I want to use the plane for business purposes if it will pay its way and if using it is not unpleasant. So far, it has been anything but pleasant.

I believe it is high time the civilian aircraft industry cleaned house—not with high sounding words and promises, but with actions.

ARTHUR J. PETERS

Holland, Mich.

● In this particular case the house-cleaning has already started. As soon as Reader Peters' letter arrived we sent a copy to his plane's manufacturer.—ED

### FLINT LANDING INSTRUMENT

Referring to the article "Lightplane Landings—by Bombsights." (March issue), it takes a great angle of descent to maintain a given airspeed for a dead stick landing than it does for a landing with the engine idling. How, then, can the developed thrust (which is dependent, among other things, on RPM, prop pitch, and engine wear) be neglected as a factor in setting the Flint landing sight?

F. B. ALEXANDER

Austin, Tex.

● FLYING's editors asked Mr. Flint to answer this question. He replied:

"A great number of people are under the false impression that a plane takes a greater angle of descent to maintain a given airspeed for a dead stick landing than it does for a landing with the engine idling. However, just the reverse of this is true.

Sink tests on an Aeronca *Chief* support my statement, but the story is true regardless of the plane. Any plane will always glide further at the same glide speed with a dead engine than it will under the same conditions with the motor idling. The *Chief* glides at its flattest angle with a dead motor at about 58 m.p.h. indicated.

"On the Flint landing instrument the glide speed, which gives maximum dead motor glide range, is calibrated in red. The fact that this information is in front of the pilot during an emergency when he needs to keep his head clear is good insurance for a safe landing. Guessing has been eliminated and the pilot is sure of two things (1) the correct glide speed to assure maximum glide range and (2) a true indication of what this maximum glide range will be at all times."

EARL E. FLINT

Middletown, O.

### FERRY TALES

I think FLYING is a great magazine but let's avoid "ferry" tales. I'm referring to your article "Alaskan Ferry" (April issue). Just because a couple of ex-Wasps made the trip it's not a great adventure.

The facts are that the Alaskan trip is a lot safer than some state-side trips. I can speak with authority on this because I work for Skyways Transport Service and have made the Alaskan trip several times. To me, it's a safe routine flight. Average time is four days (about 31 hours). There is no charge for customs except the cab fare and that doesn't apply if you go to see the customs men yourself.

For the Stinson 150's I have delivered, there were no long or dangerous flights; and with a little planning gasoline costs should not exceed 61 cents per gallon. There's nothing crude about the service. I have been able to refuel and be on my way from the station in less than 30 minutes—as good as I can do at any airport in the States.

The weather is not a worry. You can get much more accurate reports from the stations along the staging route than you can in the States. The route is not very rugged; from Grand Prairie on there is the Alcan highway which is a good landing strip for lightplanes.

JOSEPH C. STRONG

Buffalo, N. Y.

END

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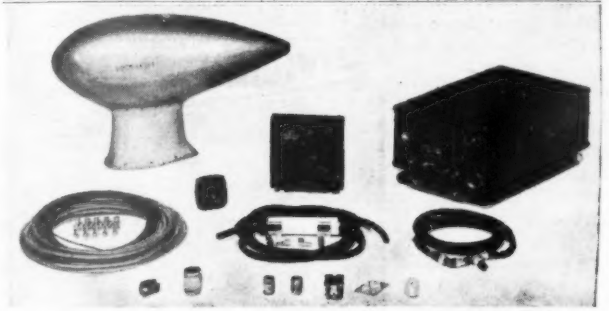

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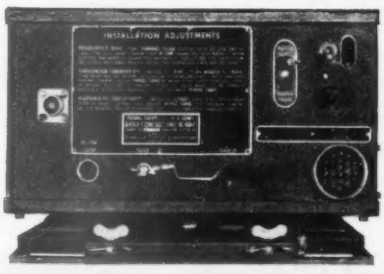

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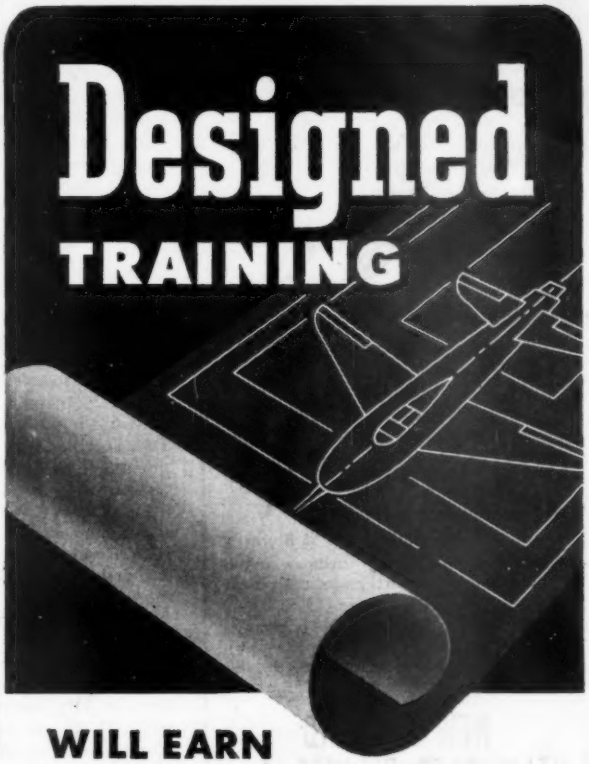

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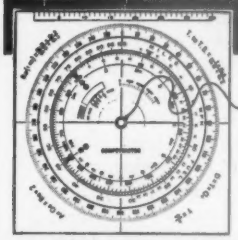

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## Flight to Breakfast

(*Continued from page 22*)

attempted to control traffic with only two light guns as equipment. Often they were swamped, with as many as a dozen planes crowding final approach at the same time. This overcrowding naturally led to some rather dangerous developments.

Smaller planes wallowed dangerously in the slipstream of large craft. The heavier planes finally were forced to land on the last half of the 7,000-foot runway —risky procedure, but the only way they could get in. The pilot of a privately-owned P-39 made a dozen passes before he could make it in his fast-landing craft. Two small planes ground-looped over in the melee, but occupants were not seriously hurt. One C-47 gave up the whole thing as a bad job—landed instead at an abandoned auxiliary strip near the Colorado River, where passengers and crew enjoyed an unscheduled picnic all to themselves.

Many went without breakfast when cooking facilities and food supplies (eggs, sausage and potatoes) proved inadequate. A few of the guests were taken into Palm Springs. But even this alternative failed when 24 station wagons, requested far in advance of the affair, did not show up at all.

But despite dangerous congestion of planes and the lack of food, good spirits prevailed. Nearly 1,500 prizes (everything from sports clothes to cases of engine oil) were awarded, with Actress Jane Withers pulling lucky names from a hat.

What's more important, Californians learned that there is far more interest in flying for flying's sake than even that air-minded state imagined. And they've taken the lesson to heart. Next year the annual flight will be held at Ensenada, Mexico, at Santa Barbara, or some other place where the field is large and unobstructed, where there are double strips and radio communications. And next year, you can wager on it, there'll be breakfast for all. END

**Answers to Do You Know?**
**on Page 80**

1. (3). The "A" and "N" signals overlap to produce a steady hum.
2. (4). Adequate night vision may be achieved in about 15 minutes but an hour is needed to reach the peak.
3. (2).
4. (4).
5. (4). Fuel flowing to the carburetor would leave a partial vacuum in the fuel tank unless air were admitted through the vent.
6. (4). An airplane engine consumes about 8,000 parts of air to each part of gasoline.
7. (2). High-h.p. engines have superchargers simply to supply additional air.
8. (4). The lift increases as the square of the velocity. Double the speed and you increase the lifting force four times.
9. (1).
10. (1).


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